LBI-39224

Operations Guide

EDACS®
CEC/IMC
MANAGER
Version 5.0 for Windows NT®

ERICSSON

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NOTICE

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INTRODUCTION

Welcome

Ericsson welcomes you to the world of mobile communications. We believe there is no equal to Ericsson products and have made a commitment to our customers to ensure that product satisfaction and reliable service is our number one priority.

Quality built and dependable, the CEC/IMC Manager, or Monitor Module (MOM) PC, is a tool designed to monitor and configure the CEC/IMC Digital Audio Switch.

About Your CEC/IMC Manager Operations Guide

This manual, written to give you a clear and concise understanding of the CEC/IMC Manager (MOM PC), is only one part of the CEC/IMC Manager Version 5.0 for Windows NT® documentation. Also included is an extensive on-line Help system when you set up CEC/IMC Manager Version 5.0 for Windows NT.

The following list outlines the various pieces of the CEC/IMC Manager for Windows NT documentation.

- The EDACS CEC/IMC Manager Operations Guide (this manual) includes a guide to setting up CEC/IMC Manager for Windows NT on your system and a brief introduction to CEC/IMC Manager for Windows NT. Along with on-line Help, this manual also provides a comprehensive guide to using CEC/IMC Manager for Windows NT. It includes explanations and procedures for first-time and advanced users.
- On-line Help provides a quick reference to procedures and commands you need when using CEC/IMC Manager for Windows NT. Context sensitive Help is also available, to obtain specific information about how to complete a dialog box, press **F1** or choose the **Help** command button while using the dialog box.

Conventions

Those users already familiar with Windows® will feel quite at home with the graphical aspects of CEC/IMC Manager for Windows NT. For those users who are not very familiar with Windows, or are a bit rusty, a brief review follows.

- An *application window* contains a running application, has a title bar, menu bar, and status bar.
- A *document window* may appear inside an application window, this type of window may contain documents, data files, groups, or directories.
- A window can be moved, changed in size, and reduced to an icon.
- The *title bar* shows the name of the application.
- The *menu bar* contains the available menus from which you can choose commands.
- The *status bar* displays various status updates such as the current time, or a description of the currently selected menu option.
- *Selecting* (single-clicking) an item usually means marking it with the selection cursor, which can then appear as a highlight, a dotted rectangle, or both; selecting alone does not start an action.
- *Choosing* (single-clicking) an item carries out an action; starting an application, opening a window, or carrying out a command, i.e. you choose an item from a menu and choose a command in a dialog box.
- A *dialog box* appears when you need to supply additional information to complete a task.
- A *text box* requires typed information by the user.
- A *list box* displays a list of choices, if there are more choices than can fit in the box scroll bars are provided so you can move quickly through the list.
- A *drop-down list box* appears initially as a rectangular box containing the current selection, when the down arrow in the square box at the right is selected a list of available choices

– appears, scroll bars are provided if there are more choices than can fit in the box.

– *Check boxes* present non-exclusive options, you can select as many options as needed, when a check box is selected it contains an **X**, names of unavailable options appear dimmed.

☐ Option 1

(unselected)

☒ Option 1

(selected)

– *Command buttons* provide instant access to or activation of commonly used operating functions, most dialog boxes have several command buttons located near the bottom of the dialog box (choose a command button to initiate an action).

Save

– *Option buttons* represent a group of mutually exclusive options; you can select only one option at a time, if you already have one option selected your current selection replaces it, the names of unavailable options appear dimmed.

◯ Option A

◉ Option B

◯ Option C

(second option, "Option B," selected)

To help you recognize needed information easily, CEC/IMC Manager for Windows NT will use consistent visual and text formats.

– Dialog box titles and menu choices will be designated by the following text style: TDM Bus Slots, Configure System.

– Text boxes, list boxes, fields, etc. within dialog boxes will be designated by first letter in upper case: Channel Signaling text box, Configurable Sites list box, User Name fields.

– Command buttons will be introduced for a particular dialog box as follows:

Save

and will be designated within the text as: **Save**.

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1. CHAPTER 1
GETTING STARTED

1.1 ABOUT CEC/IMC MANAGER V5.0

Starting with release (version) 5.0 the CEC/IMC Manager is a 32 bit Windows NT application. To provide remote management capability the architecture of the CEC/IMC Manager is Client/Server. The application is divided into two executables; GUI_SRVR.exe is the Server application that runs as a Windows NT service, and W_GUI.exe is the Graphical User Interface (GUI) application run from the ICON selected in the WINMOM program group. This release of CEC/IMC Manager also includes an optional SNMP agent that runs as a Windows NT service. The SNMP agent is required to provide a Network Management station remote monitoring of the CEC/IMC Manager directly and the CEC/IMC by proxy. The installation procedure for this agent is found in APPENDIX C - SNMP AGENT and PROXY for CEC/IMC (Optional). Once installed, configure the agent in accordance with the configuration procedures in *EDACS® Network Management Installation and Technical Reference Manual* (LBI-39171).

Throughout this program there will be references to configuration data saved to, stored at, and read/retrieved from the CEC/IMC Manager hard disk. This hard disk is located at the machine (PC) that the GUI_SRVR.exe is running from, not the machine running the GUI application unless the same machine is performing both services. In most cases, if not all, the machine running the server (GUI_SRVR.exe) will be local to the CEC/IMC.

The CEC/IMC Manager for Windows NT Client has been ported to HP-UX platforms to run in conjunction with Network Manager. For users running an HP-UX version of the CEC/IMC Manager Client all references in this manual to W_GUI.exe, Graphical User Interface (GUI), or CEC/IMC Manager for Windows NT Client should be considered "CEC/IMC Manager HP-UX Client."

1.2 ABOUT THIS MANUAL

This manual describes the CEC/IMC Manager (MOM PC) user interface and functions. It is intended to aid the user in performing various CEC/IMC Manager functions such as CEC/IMC configuration

and viewing interface module status data. The various screens and terms the user may encounter are walked through and explained in full detail. The following sub-sections highlight the major functions of the CEC/IMC Manager.

1.2.1 System Configuration

CEC/IMC Manager Configuration

- **CEC/IMC Manager User Profiles** – Configure CEC/IMC Manager user accounts. This includes user names, passwords, and access levels.
- **CEC/IMC Manager Hardware** – Set serial interface baud rates for System Manager and CEC/IMC Manager, enable/disable data logging, and set the datalog threshold number.
- **CEC/IMC Manager Font Selection** – Select font type and size for optimum compatibility with Network Manager platforms.

CEC/IMC Configuration

- **Trunked and Console Channels** – Adjust audio levels and other related parameters for each site-type, console, and EDACS Data Gateway™ (EDG) interface.
- **Conventional Channels** – Adjust audio levels, type of control (tone, dc, etc.), and other related parameters for conventional channel interfaces. Set conventional channels for Causeway patch or Causeway simulselect operation.
- **Digital Voice Channels** – Configure digital voice channels for either pooled (dynamic) or dedicated call assignment operation.
- **Logging Recorders** – Configure logging recorder parameters such as output level and assigned entity (unit, group, etc.).
- **TDM Buses** – Configure the number of TDM buses to match number of buses supported by the installed CEC/IMC Audio Boards.
- **TDM Bus Time Slots** – Allocate the number of TDM bus time slots required by each site-type, console, digital voice,

and EDACS Data Gateway (EDG) interface. In release 5.0 CEC/IMC Manager TDM bus time slots are allocated from each site, console, or DVIM interface audio configuration dialog box.

System Options

- **Auxiliary I/O** – Program auxiliary I/O events.
- **Multisite Unit Logout** – Configure multisite unit logout parameters for each unit, both timer-based and instant command logouts are provided View unit and group location information.
- **Confirmed Call** – Configure confirmed call options, exempt sites from confirmation process and enable automatic confirmed call database repair.
- **ProSound** – Configure ProSound™ site adjacency information for each site. This information is used during wide area scan operations.
- **File Transfer** – Transfer unit, group, and site databases from the System Manager to the CEC/IMC Manager. Distribute System Manager database information stored at the CEC/IMC Manager to CEC/IMC interface modules.
- **Distributed Multisite/StarGate Networks** – Configure Network Interface Module (NIM) and StarGate network options such as NIM baud rates, NIM audio channel parameters, and conventional channel settings.
- **Time and Date** – Set system time and date source. This can be broadcast throughout the entire CEC/IMC for time synchronization. Also configure the NETCLOCK/2 interface (optional).
- **Digital Console Pre-empt** – Digital console pre-empt allows for console pre-empting of digital calls. (This feature may require Site Controller or GETC™ interface and radio software changes.)
- **Telephone Interconnect** – The modifications allow "Caller ID" on inbound interconnect calls, and Multiple Jessica options on StarGate systems.

Console Configuration

- **Console Hardware Configuration** – Perform special console hardware configurations for C3 Maestro™ consoles.
- **Console User Profiles** – Configure console user-specific parameters. Up to ten (10) different console user profile set-ups (shifts) are available for each console.
- **Console Privilege Lists** – Assign unit, group, and conventional channel privileges to each console.
- **C3 Modular/Desktop Consoles** – Perform special console configurations for C3™ Modular/Desktop consoles.
- **View Patch/Simulselect** – View the various patches and simulselects established within the CEC/IMC system.

1.2.2 System Monitoring

- **View Node Data** – View status and errors on an interface module-by-interface module basis.
- **Feature Data** – View currently licensed features and capacities.
- **Diagnostics** – View interface module (CAM, CIM, CTIM, DVIM, LRIM, MIM, MOM, etc.) errors and messages on an interface module-by-interface module basis.
- **Statistics** – View interface module (CAM, CIM, CTIM, DVIM, LRIM, MIM, MOM, etc.) statistics, their assignments, and associated GSC node address on an interface module-by-interface module basis. Also reports Global Serial Channel (GSC) Bus loading.

1.2.3 Help

- **Help** – On-line Help provides a quick reference to procedures and commands you will need when using the CEC/IMC Manager. Context sensitive Help is available to provide specific information about how to complete a dialog box.

1.3 DATA LOGGING FEATURE

One of the most important features of the CEC/IMC Manager (MOM PC) is its ability to log data. All data that is placed on the GSC Bus in the CEC/IMC is logged at the MOM Controller Board. The MOM Controller Board then periodically dumps its data log buffer to the CEC/IMC Manager through their serial link. The CEC/IMC Manager writes this data to its hard disk, where it can be extracted and viewed either on- or off-line. The on-line functions are available under System Monitoring Diagnostics. The off-line functions are:

CALLS.EXE	Used to extract all calls made within the CEC/IMC.
GSCMON.EXE	Used to extract all messages from the logged data.

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2. CHAPTER 2
INSTALLATION

2.1 UNPACKING

After opening this package, verify you have received the following:

- CEC/IMC Manager Version 5.0 for Windows NT software—located on 3-1/2 inch diskettes; this software will be already installed on the computer's hard drive for a new system
- this manual (LBI-39224)

2.2 CEC/IMC MANAGER REQUIREMENTS

The following minimum hardware and software configuration is required to operate the CEC/IMC Manager V5.0x.

A. An IBM® Compatible PC with a 75 MHz Pentium® microprocessor (or better) running Microsoft® Windows NT V3.51 (or better) with the following minimum configuration:
   - Service Pack #3 or better installed
   - At least 16 Mbytes of RAM
   - A 540 Mbyte hard disk
   - Two (2) serial ports

B. VGA video card and monitor (or better).

IMPORTANT NOTE!

Ensure that the MIGRATE.BAT utility supplied with the "CEC/IMC Manager Version 5.0 for Windows NT" software is executed to save that original (DOS) CEC/IMC Manager configuration BEFORE installing Windows NT on any computer already running a DOS version of the CEC/IMC Manager.

2.3 DISKETTE HANDLING

While working with your diskettes you should consider the following handling procedures:

- Always store diskettes in their envelope
- Insert diskettes into the drive carefully
- Use only felt tipped pens to write on a diskette label
- Store diskettes at a comfortable room temperature
- Refrain from touching the recording surface
- Do not bend the diskettes
- Do not allow any form of liquid to come in contact with the diskette surface
- Keep diskettes away from magnetic fields as found in electronic equipment.

If you follow these simple guidelines you will receive long service from your diskettes.

2.4 MAKING BACKUPS

This software is provided on 3-1/2 inch diskettes labeled "CEC/IMC Manager V5.0 for Windows NT." These diskettes are very sensitive and fragile, and should be handled with care and stored in a secure area.

NOTE

The CEC/IMC Manager software is pre-installed at the factory (WINMOM directory) for new systems.

We recommend that upon receipt of your original diskettes you store them in a safe place. This ensures the availability of an accurate program should the installed program fail during operation.

NOTE

It is important to use the DISKCOPY command when making a backup and not the COPY or XCOPY commands. The diskette contains a volume label that is required for the installation process and COPY and XCOPY do not copy volume labels.

2.5 MULTIPLE REMOTE CLIENTS

The CEC/IMC Manager Remote Client (W_GUI.exe) can be executed from any PC that is running Windows NT v3.51 or better and connected to the same LAN as the desired CEC/IMC Manager server. A maximum of ten (10) remote clients are supported.

Single CEC/IMC Manager (No LAN)
NO command line options are necessary for the Local CEC/IMC Manager if the default machine name was selected for the Local CEC/IMC Manager machine (default = "MOM_NT").

Multiple CEC/IMC Managers on LAN
If ANY other machine name is used other than the default machine name (default = "MOM_NT"), the following action must be performed. Depending on the LAN Transport one of the following "command line options" MUST be added to the File/Properties dialog box:

COMMAND LINE OPTIONS for Remote Client (network connection)

W_GUI.exe <machine name> Networks without TCP/IP
W_GUI.exe <IP address> TCP/IP networks

See Figure 1 in the following chapter for an example of a CEC/IMC Manager on a TCP/IP network, the IP address is displayed in the CEC/IMC Manager main window title bar. Figure 3 is an example of a CEC/IMC Manager set up as a single (Local) CEC/IMC Manager.

2.6 UPGRADE CEC/IMC MANAGER

NOTE

Ensure that the requirements of MULTIPLE REMOTE CLIENTS (Step 2.5 above) are fulfilled before proceeding.

1. VERIFY that the MIGRATE.BAT utility has been executed to save the original (DOS) CEC/IMC Manager configuration.
2. Insert the "Install" CEC/IMC Manager V5.0 for Windows NT diskette and execute SETUP.EXE. This setup utility will:
   - Copy all necessary Executables and DLLs
   - Install the CEC/IMC Manager server as a service
   - Install the CEC/IMC Manager GUI
   - Setup Program Groups and CEC/IMC Manager Icons
   - Execute the necessary registry edits
3. (OPTIONAL) Insert the "Install" SNMP Agent Diskette and execute SETUP.EXE.
4. Insert the "Migrate Utility" diskette and execute MIGRATE.BAT to transfer the previous (DOS) CEC/IMC Manager configuration to the just installed (Windows NT) CEC/IMC Manager. This should be the second time MIGRATE.BAT was run since the original (DOS) CEC/IMC Manager configuration was saved using this utility on the (DOS) CEC/IMC Manager machine. In a DOS Window:
   From the C:\WINMOM prompt type **a:\migrate TO**.
5. Reboot the CEC/IMC Manager PC.
6. Double-click on the CEC/IMC Manager icon (in the WINMOM program group) to execute the CEC/IMC Manager GUI.

IMPORTANT NOTE

Expect to see "NOVRAM MISMATCH" Popup windows. These occur because the DOS MOMPC did not save Bus/Slots to disk. Although the Migration utility preserved much of the configuration, the bus/slots at the CEC/IMC Manager will be zero and the MOM Controller will hold the valid Bus/Slots configuration. By following steps 7-13 the entire slot database should be stored to the CEC/IMC Manager V5.0 hard disk.

7. The TDM Bus/Slots must be read from the CEC/IMC in the Console Audio Configuration screens.
   a) Select Menu Option Configure System / CEC/IMC Configuration / CIM.
   b) Select ALL consoles that are displayed in the Configured/Active Consoles list box.
   c) Choose the **Modify** button.
   d) For each console push the **CEC/IMC to Disk** button.
   e) Verify the Slots match in the Upper and Lower list boxes for ALL channels.
8. The TDM Bus/Slots must be read from the CEC/IMC in the CTIM Audio Configuration screens.
   a) Select menu option Configure System / CEC/IMC Configuration / CTIM.
   b) Select ALL CTIMs that are displayed in the Configured/Active Sites list box.
   c) Choose the **Modify** button.
   d) For each CTIM push the **CEC/IMC to Disk** button.
   e) Verify the Slots match in the Upper and Lower list boxes for ALL channels.
9. The TDM Bus/Slots must be read from the CEC/IMC in the Site Audio Configuration screens.
   a) Select menu option Configure System / CEC/IMC Configuration / MIM.
   b) Select ALL sites that are displayed in the Configured/Active Sites list box.
   c) Choose the **Modify** button.
   d) For each site choose the **CEC/IMC to Disk** button.
   e) Verify the Slots match in the Upper and Lower list boxes for ALL channels.
10. The TDM Bus/Slots must be read from the CEC/IMC in the PIM Audio Configuration screens.
    a) Select menu option Configure System / CEC/IMC Configuration / PIM.
    b) Select ALL PIMs that are displayed in the Configured/Active Sites list box.

c) Choose the **Modify** button.

d) For each PIM choose the **CEC/IMC to Disk** button.

e) Verify the Slots match in the Upper and Lower list boxes for ALL channels.

11. The TDM Bus/Slots must be read from the CEC/IMC in the NIM Audio Configuration screens.

    a) Select menu option Configure System / CEC/IMC Configuration / NIM.

    b) Select ALL NIMs that are displayed in the Configured/Active Sites list box.

    c) Choose the **Modify** button.

    d) For each NIM choose the **CEC/IMC to Disk** button.

    e) Verify the Slots match in the Upper and Lower list boxes for ALL channels.

12. The TDM Bus/Slots must be read from the CEC/IMC in the DVIM Audio Configuration screens.

    a) Select menu option Configure System / CEC/IMC Configuration / DVIM.

    b) Select ALL DVIMs that are displayed in the Configured/Active DVIM list box.

    c) Choose the **Modify** button.

    d) For each DVIM choose the **CEC/IMC to Disk** button.

    e) Verify the Slots match in the Upper and Lower list boxes for ALL channels.

13. The TDM Bus/Slots must be read from the CEC/IMC in the VMIM Audio Configuration screens.

    a) Select menu option Configure System / CEC/IMC Configuration / VMIM / Audio Configuration.

    b) Select ALL VMIMs that are displayed in the Configured/Active Sites list box.

    c) Choose the **Modify** button.

    d) For each VMIM choose the **CEC/IMC to Disk** button.

    e) Verify the Slots match in the Upper and Lower list boxes for ALL channels.

14. Any T1/E1 node databases must be defined or converted from analog to T1 or E1. See the T1/E1 Installation Instructions for more details on setting the T1/E1 databases.

2.7 SYSTEM HOOK-UP

Connect all peripheral equipment to your computer prior to configuring the software items described in Chapter 3 of this manual. Refer to the operating manuals of each device for correct installation procedures. Also see *CEC/IMC Digital Audio Switch Installation, Set-Up and Troubleshooting* (LBI-38938) for interconnection details. Upgrade all software/firmware at the CEC/IMC Controller and Audio Boards as described in *CEC/IMC Manager V5.0 for Windows NT® Release Notes* (350A1874).

If your system is already established, verify you have all the equipment necessary to execute the program and isolate all connecting cables to prevent tangling, interference, and damage.

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3. CHAPTER 3
OPERATION AND CONFIGURATION

The primary intent of this chapter is to describe CEC/IMC Manager program operation, and valid CEC/IMC Manager and CEC/IMC Digital Audio Switch configuration settings. In some cases detailed system-level information is presented where necessary. This chapter is arranged in the order recommended for the set-up of a new CEC/IMC Digital Audio Switch. Refer to the set-up information within LBI-38938 and other referenced documents for additional information as necessary.

3.1 STARTING THE PROGRAM

This chapter assumes that program software loading and system hookups have been completed. The program software is installed at the factory for new systems; however, refer to Section 2.7, SYSTEM HOOK-UP of the previous chapter if system hookup has not been accomplished.

3.1.1 Default User Account

From the Windows NT Program Manager open the CEC/IMC Manager program and the CEC/IMC Manager main menu (Figure 1) will be displayed.

The bottom status bar displays several messages that are helpful or important to the CEC/IMC Manager user. "For Help, press F1" or the current menu choice and the current time are displayed at each end of the status bar. System status—"No System Errors" or "System Errors"—and Link status—"Mom Link is Up" or "Mom Link is Down"—provide the user with important information concerning system operation.

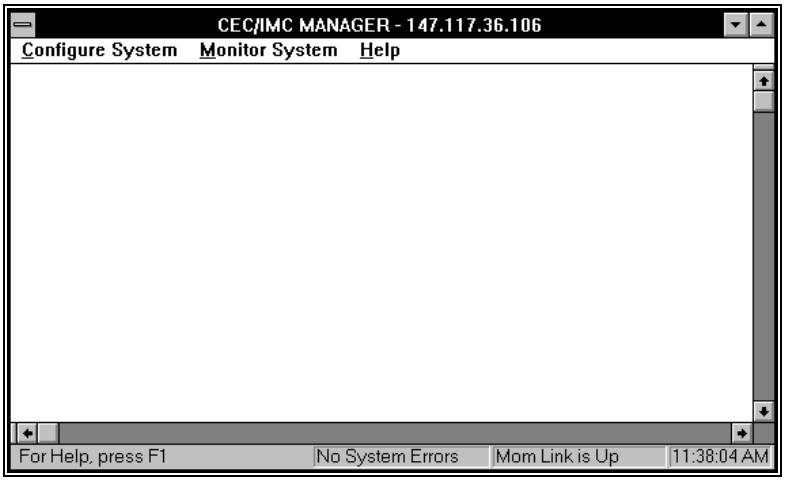


Figure 1 CEC/IMC Manager Main Window and Menu Bar

Selecting any of the choices from the CEC/IMC Manager menu bar (Configure System, Monitor System, Help) will display the Login dialog box. You will be prompted to enter a user name and password before execution of the program will continue. The default user name is "MOMUSER" and the default password is "GUEST." These log-in defaults are provided in the PASSWORD.DAT file that is part of the CEC/IMC Manager installation.

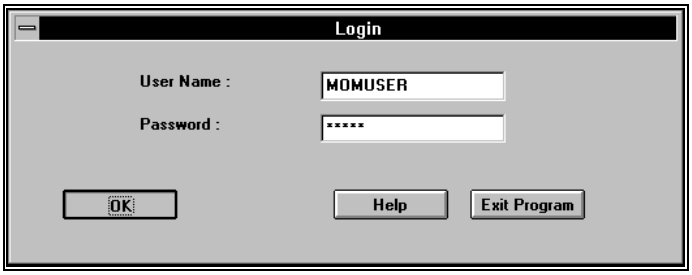


Figure 2 CEC/IMC Manager Login

Default User Name: MOMUSER
Default User Password: GUEST

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

OK

Choose the **OK** button to save any new settings, activate those settings, and exit the current dialog box.

Exit Program

Choose the **Exit Program** button to exit the CEC/IMC Manager program and return to the Windows NT Program Manager.

3.2 USER ACCOUNT CONFIGURATION

Up to twelve (12) different user accounts can be configured for the CEC/IMC Manager. Each user has an account which defines the user's name, password, and access level. The default user account, "MOMUSER," has a password of "GUEST" and a "System Administrator" access level. For Network Manager stations the default user account is "NMUSER" and has a password of "GUEST." This default account is active the first time the program is executed and it remains as one of the twelve accounts unless it is deleted. These log-in defaults are provided in the PASSWORD.DAT file that is part of the CEC/IMC Manager installation. To prevent unauthorized access, deleting this default account after at least one "System Administrator" account is configured and safeguarding the PASSWORD.DAT file by the system administrator are recommended. This file may be used as a backup in the event that passwords are forgotten or the installed PASSWORD.DAT file is deleted. All user accounts are set up from the CEC/IMC Manager Configuration menu.

IMPORTANT NOTE!

In multi-user environments it is possible for two users to be changing the same data. In these situations, the data saved, and subsequently used to configure the CEC/IMC, will be from the last "Save." Therefore, it is important to give administrative privileges (access level) only to those users authorized to make changes to the system configuration. See also NOTE below.

NOTE

Certain menu selections may be "grayed-out," indicating that those menu selections (functions) are not available to that access level. See User Access Level (later in this section) for those functions available to the various access levels.

From the CEC/IMC Manager menu bar select Configure System / CEC/IMC Manager Configuration to display the CEC/IMC Manager Configuration menu, shown in Figure 3.

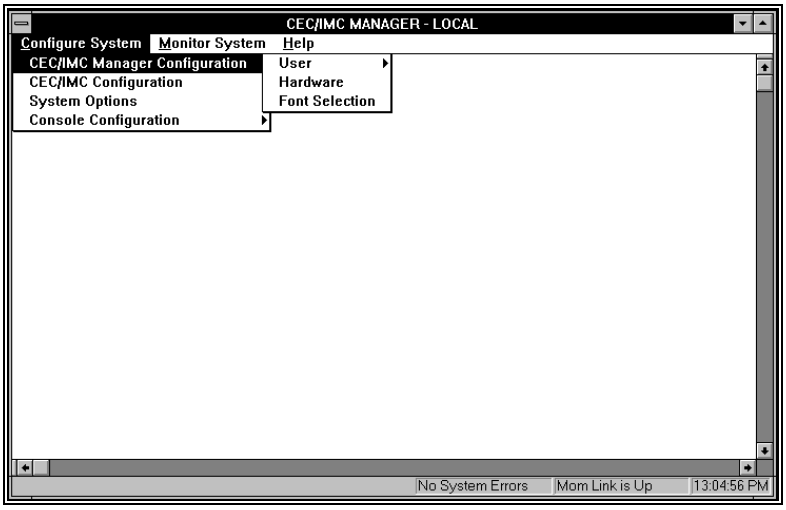


Figure 3 CEC/IMC Manager Configuration Menu

From the CEC/IMC Manager menu bar select Configure System / CEC/IMC Manager Configuration / User to display the User menu. This menu provides the means to set-up and modify user accounts.

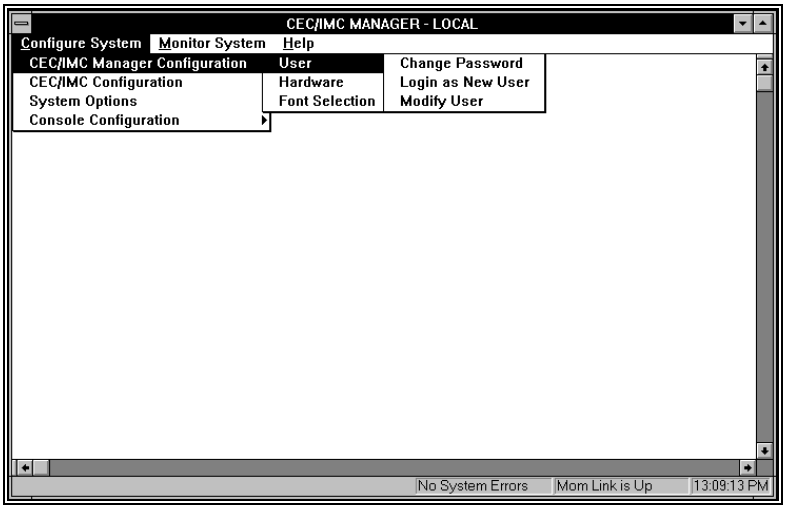


Figure 4 CEC/IMC Manager Configuration User Menu

3.2.1 Set Up Accounts

This option is used to add a new user account. Adding a new user account involves adding the new user name, selecting a password, and establishing the access level. This is done in the Add/Modify/Delete Users dialog box, Figure 5, by selecting Modify User from the User menu. Only users with a system administrator access level may access this option.

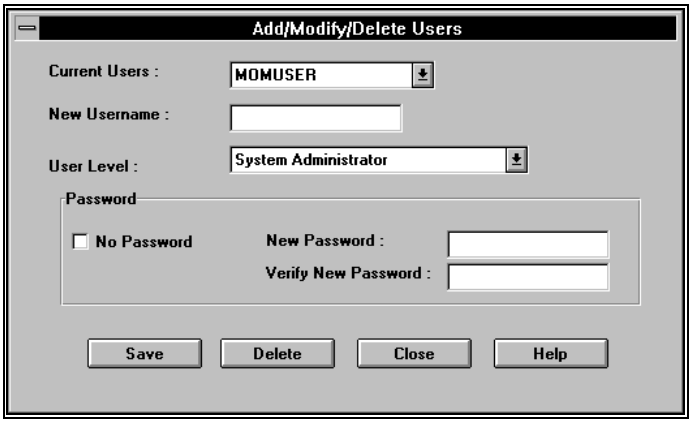


Figure 5 Add/Modify/Delete Users Dialog Box

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

Add User

Enter the new user in the New Username text box. When a new user name is entered (typed) in this text box the **Add** button appears, taking the place of the **Save** and **Delete** buttons.

User Access Level

The access levels are "System Administrator," "Console Administrator," "General Maintenance," and "User."

- System Administrator – this level has access to all system functions.
- Console Administrator – this level has access to system monitoring functions (Monitor System on CEC/IMC Manager menu bar) and console configuration functions (Console Configuration from the Configure System menu).
- General Maintenance – this access level is currently not supported. Selecting this access level will result in the same access level as "User."
- User – this level has access only to system monitoring functions (Monitor System on CEC/IMC Manager menu bar).

User Password
Select (no password required) or unselect (password required) the No Password check box as required for the new user. If selected, no further action is required. If unselected, enter the password in the New Password text box, then re-enter the password in the Verify New Password text box.

Add

Choose the **Add** button to add and save the new user account. This button appears, taking the place of the **Save** and **Delete** buttons, when a new user name is entered (typed) in the New Username text box. When the **Add** action is complete the **Save** and **Delete** buttons will reappear, taking the place of this button.

Save

Choose the **Save** button to save any changes to user account configurations to the CEC/IMC Manager hard disk.

Delete

Choose the **Delete** button to delete the selected user account.

Close

Choose the **Close** button to exit this dialog box and return to the main menu. If any changes have been made and not saved, you will be prompted (Write Changes to Disk?) to save and exit (**Yes**), exit without saving (**No**), or cancel the **Close** command and remain in the dialog box (**Cancel**).

3.2.2 Modify Accounts

This option can be used to change user accounts or delete an account. Only users with a system administrator access level may perform most of these changes.

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

OK

Choose the **OK** button to save any new settings, activate those settings, and exit the current dialog box.

Cancel

Choose the **Cancel** button to immediately exit the current dialog box without saving or activating any new settings.

Login As New User
Selected users may be able to login to the CEC/IMC Manager program as a new (different) user, this "new" user must be a currently existing user in the system. This option is performed from the Login dialog box (Login As New User menu selection). Enter the new user name in the User Name text box, enter the password for that user name in the Password text box, and then choose the **OK** button to login under the new user name.

Change Password
This option is used to change the password of an existing account. This option is performed in the Set Password dialog box (Change Password menu selection). Users that do not have a system administrator access level may change only their own password. System administrators may change any user account password.

Change Access Level
System administrators can use this option to change the access level of a given user account. This option is performed from the Add/Modify/Delete Users dialog box (Modify User). Select the account to be changed from the Current Users drop-down list box, select the new access level from the User Level drop-down list box, then choose the **Save** button to save and activate the change.

Delete Account
System administrators can use this option to delete user accounts. This option is performed from the Add/Modify/Delete Users dialog box (Modify User). Select the account to be deleted from the Current Users drop-down list box, choose the **Delete** button to delete the account.

3.3 CEC/IMC MANAGER FONT SELECTION

The CEC/IMC Manager Graphical User Interface (GUI) can be executed on the Network Management platform, which maintains a set of fonts different from the CEC/IMC Manager PC fonts. Therefore, the CEC/IMC Manager has a font selection dialog box; this font selection is saved to disk by User Name. In some instances a particular font selection that works fine at one platform may not work properly at

another platform when the user logs in; in such instances a user may need to have accounts at each platform under different user names with a font selection for that particular platform. Because there is variation between platforms font selection may be somewhat of a "trial-and-error" process to determine the best font combinations. See APPENDIX D - FONT SELECTABLE DIALOG BOXES for a list of dialog boxes that are affected by the user selected fonts.

CEC/IMC Manager font selection is done in the Font dialog box. From the CEC/IMC Manager main menu bar select Configure System / CEC/IMC Manager Configuration / Font Selection to display the Font dialog box.

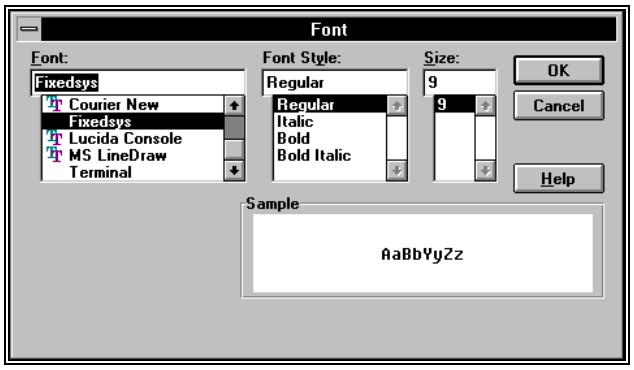


Figure 6 Font Selection Dialog Box

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

Select the desired/required Font, Font Style, and Size from their respective list boxes. As mentioned previously, because of the variation between platforms, font selection may be somewhat of a "trial-and-error" process to determine the best font combinations.

Cancel

Choose the **Cancel** button to exit the Font dialog box without saving or activating any new settings.

OK

Choose the **OK** button to save any new settings, activate those settings, and exit the Font dialog box.

3.4 INITIAL CEC/IMC MANAGER AND MOM CONTROLLER BOARD CONFIGURATION

The CEC/IMC Manager Configuration dialog box, shown in Figure 7, is the configuration point for several CEC/IMC Manager and CEC/IMC MOM Controller Board-related parameters. From the CEC/IMC Manager menu bar select Configure System / CEC/IMC Manager Configuration / Hardware (see Figure 3) to display the CEC/IMC Manager Configuration dialog box. These parameters include selecting one of the PC serial COM ports, setting the serial baud rates for the CEC/IMC Manager-to-MOM Controller Board and System Manager-to-MOM Controller Board serial links, enabling/disabling data logging, and setting the datalog delete threshold number.

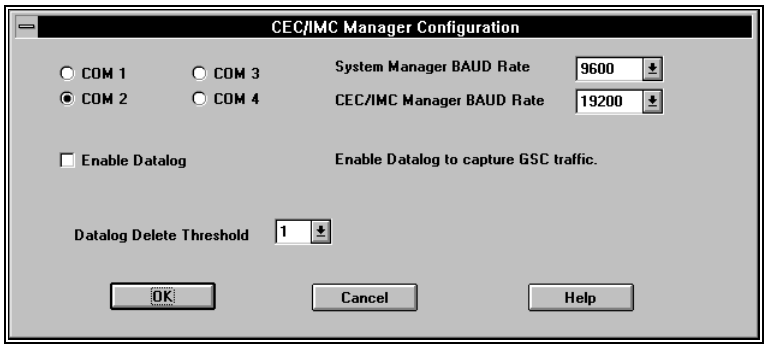


Figure 7 CEC/IMC Manager Configuration Dialog Box

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

Cancel

Choose the **Cancel** button to immediately exit the CEC/IMC Manager Configuration dialog box without saving or activating any new settings.

PC COM Port Selection

Communication port selection for the PC serial port, the CEC/IMC Manager ⇔ MOM Controller Board serial control data link, is accomplished via the COM selections in the CEC/IMC Manager Configuration dialog box. COM ports 1 thru 4 are supported. Select

COM 1, COM 2, COM 3 or COM 4, as required using the respective option button in the dialog box.

The selected serial port interrupt request line (IRQ) and base I/O port address settings are established from the Microsoft Windows NT Control Panel program settings. Typically, no IRQ or address changes are ever required. However, if using non-standard serial port hardware, changes may be necessary. If using non-standard serial port hardware, consult the hardware manufacture's documentation for specific IRQ and base I/O address details.

CEC/IMC Manager-MOM Baud Rate

Baud rate selection for the CEC/IMC Manager ⇔ MOM Controller Board serial link is accomplished using the CEC/IMC Manager BAUD Rate drop-down list box. In this list box baud rates of 9600 and 19.2k baud are available, select 9600 or 19.2k baud as required. This setting configures the previously chosen PC COM port for the selected rate. Since the MOM Controller Board port used for CEC/IMC Manager interfacing is auto-baud sensing, a baud rate change at the MOM Controller Board is not necessary when a change is made in this list box.

System Manager-MOM Baud Rate

The MOM Controller Board port used for interfacing with the System Manager computer is configurable for 9600 or 19.2k baud using the System Manager BAUD Rate drop-down list box. Unlike the CEC/IMC Manager ⇔ MOM Controller Board setting, this setting must match the setting at the System Manager before MOM Controller Board ⇔ System Manager communication can occur, the System Manager is not equipped with an auto-baud serial port. Refer to your particular System Manager LBI for System Manager baud rate configuration information. Select 9600 or 19.2k baud as required from the drop-down list box.

Data Logging Of GSC Traffic

Once each day at midnight (00:00), the CEC/IMC Manager creates a new datalog file and it names the file in accordance with the date. For example, a datalog file created on July 2, 1996 will be named `07_02_96.DLG`. This data can be viewed using the on-line Calls Translation and GSC Monitor functions (available by selecting Monitor System on the CEC/IMC Manager menu bar) described in Chapter 4, SYSTEM MONITORING, or the CALLS.EXE and

GSCMOM.EXE off-line programs as described in Chapter 5, OFF-LINE DIAGNOSTIC FUNCTIONS.

If data logging is desired, select the Enable Datalog check box. With this feature enabled the CEC/IMC Manager will log GSC traffic such as channel assignments and drops.

The datalog delete threshold feature automatically deletes old datalog files which are stored on the CEC/IMC Manager's hard disk drive. A stored datalog file that is older than the number of days in the Datalog Delete Threshold will be deleted at midnight. This prevents hard disk drive "disk full" errors. Datalog files will also be deleted if the Datalog Delete Threshold number is reduced. For example, if the previous number was "8" (8 days) and the number is reduced to "5" (5 days) in the CEC/IMC Manager Configuration dialog box, the three datalog files that are more than 5 days old will be deleted from the hard disk drive at midnight. The range for the Datalog Delete Threshold number is 1 to 50. The value selected here should be at least equal to the number of days between back-ups of the datalog files such that they are saved before the CEC/IMC Manager automatically deletes them from the hard disk drive. ERROR.DLG and WARN.DLG files are not affected by the Datalog Delete Threshold setting.

OK

Choose the **OK** button to save any new settings, activate those settings, and exit the CEC/IMC Manager Configuration dialog box.

3.5 SYSTEM TIME AND DATE

This function is used to select the source of system time and date. This time and date is broadcast throughout the entire CEC/IMC for time synchronization. This function is performed from the Configure System Clock Synchronization dialog box. From the CEC/IMC Manager menu bar select Configure System / System Options / System Clock to display the Configure System Clock Synchronization dialog box, Figure 9.

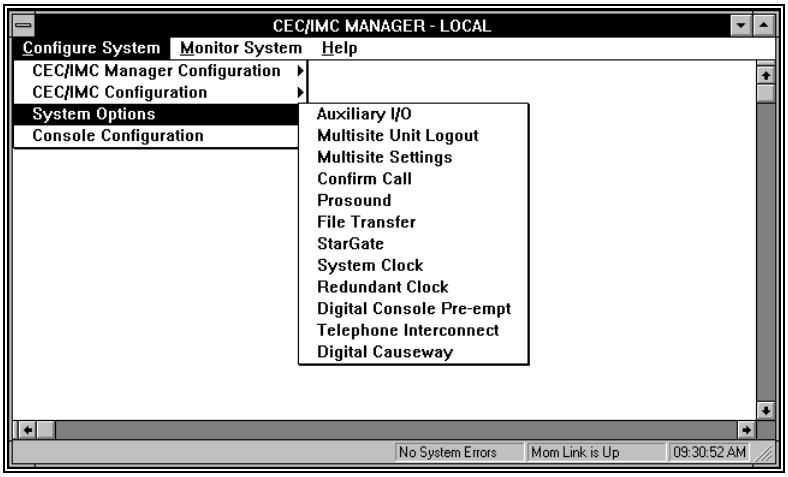


Figure 8 System Options Menu

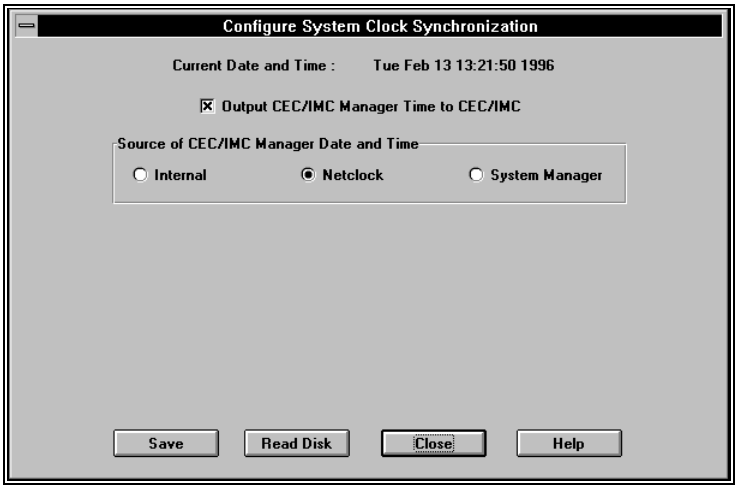


Figure 9 Configure System Clock Synchronization Dialog Box

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

Current Time and Date

The system's current time and date is displayed in this field, the time is in a 24-hour format (11:00:00 PM would be 23:00:00).

Output CEC/IMC Manager Time to CEC/IMC
Select (enable) this check box to cause the CEC/IMC Manager time to update the CEC/IMC time. The default is "selected"—"Output CEC/IMC Manager Time to CEC/IMC." Unselect (disable) to force the CEC/IMC to run on its own internal clock. This box should be selected (enabled) if using the NETCLOCK/2 option. This box must be unselected (disabled) if using the System Manager as the time source.

Source of CEC/IMC Manager Date and Time
This field defaults to "Internal." With the default setting, the CEC/IMC Manager (MOM PC) time will be maintained by the PC internal battery-backed clock.

The CEC/IMC can also receive its time from the System Manager. Select the "System Manager" option button to enable CEC/IMC time updates based on the System Manager time. If this option is selected, the Output CEC/IMC Manager Time to CEC/IMC option must be unselected (disabled).

If the Netclock/2 option is installed, select the "Netclock" option button. See WWVB TIME STANDARD CONFIGURATION on page 3-199 for more information on Netclock installation and operation.

Read Disk

Choose the **Read Disk** button to display the current system time configuration from the CEC/IMC Manager hard disk.

Save

Choose the **Save** button to save any changes to the system time configuration to the CEC/IMC Manager hard disk.

Close

Choose the **Close** button to exit this dialog box and return to the main menu. If any changes have been made and not saved, you will be prompted (Write Changes to Disk?) to save and exit (**Yes**), exit without saving (**No**), or cancel the **Close** command and remain in the dialog box (**Cancel**).

3.6 SYSTEM MANAGER DATABASE UPLOADS

The CEC/IMC uses data from the System Manager Unit and Group databases to control routing of all wide area (multisite) calls. These databases must be setup correctly at the System Manager before the System Manager data is transferred to the CEC/IMC. The CEC/IMC

Manager user is able to select unit, group, and site data from the System Manager; or unit, group, and site data, along with conventional and console unit ID databases from the CEC/IMC Manager hard disk, and broadcast (transfer) this data to all interface modules. If the data is transferred from the System Manager it is also stored on the CEC/IMC Manager hard disk.

NOTE

If the System Manager operates with version 4.0 (or earlier) software, console aliases and LIDs can be changed at the CEC/IMC Manager. However, it is recommended that a console LID stored at the CEC/IMC Manager be given the same alias as the corresponding console LID at the System Manager; in other words, changing console aliases at the CEC/IMC Manager is not recommended if a System Manager exists.

If the network's System Manager operates with version 5.0 (or later) software, a console alias cannot be changed at the CEC/IMC Manager. Therefore, CEC/IMC Manager console aliases will always match System Manager console aliases.

NOTE

Conventional Channel aliases and LIDs are assigned to a channel number at the CEC/IMC Manager, but it is recommended that these entries match valid conventional channel aliases and LIDs defined at the System Manager. This will ease conventional channel identification during patch operations. A console communicates with a conventional channel by its channel number—not its LID number.

Database transfers (uploads/downloads) are accomplished using the System Mgr/Network Mgr Entity Database dialog box. From the CEC/IMC Manager menu bar select Configure System / Systems Options / File Transfer to display the System Mgr/Network Mgr Entity Database dialog box, Figure 10.

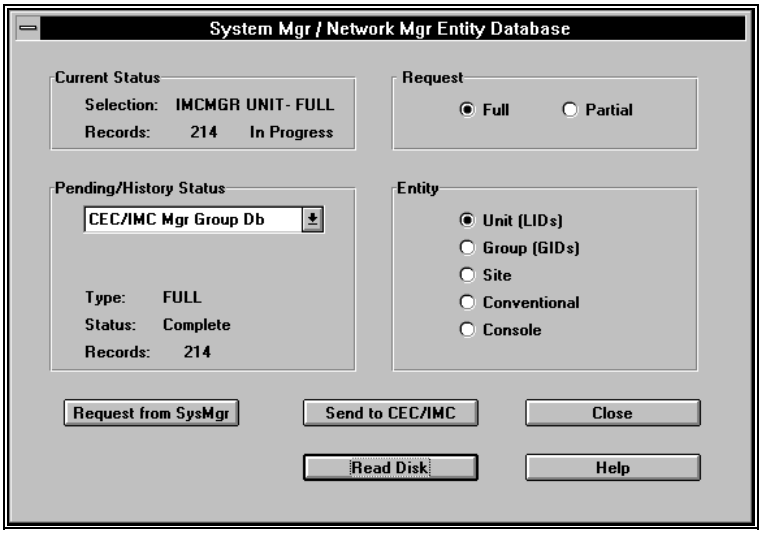


Figure 10 System Mgr/Network Mgr Entity Database Dialog Box

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

Close

Choose the **Close** button to exit the System Mgr/ Network Mgr Entity Database dialog box and return to the CEC/IMC Manager main window.

Current Status

The Current Status box provides information about the transfer currently in progress or the most recent transfer. Selected transfer type, whether "In Progress," "Complete," or "Failed," and number of Records involved are displayed.

Request

The Request box allows the user to select between Full or Partial file transfers. Transfers from the System Manager may be either full or partial for all entities except Site. Only full transfers are supported from the CEC/IMC Manager.

Pending/History Status

The fields under Pending/History Stats give information about the upload, received at the CEC/IMC Manager, selected from the drop-

down list box: whether it was full or partial, status, and number of records in the database file that were updated.

Entity
The Entity box allows the user to select the entity database to be updated. Transfers from the System Manager may be Unit, Group, or Site. Transfers from the CEC/IMC Manager may be any of the available options.

3.6.1 Transfer From System Manager

If a "Transfer From System Manager" is desired, all data will be requested from the System Manager. Select either Full or Partial transfer using the option buttons in the Request box. Select unit, group, or site database to transfer using the option buttons in the Entity box, keep in mind that a partial site transfer is not allowed.

Request from SysMgr

Choose the **Request from SysMgr** button to initiate a System Manager based database transfer.

Send to CEC/IMC

Choose the **Send to CEC/IMC** button to broadcast the currently requested database transfer to the CEC/IMC interface modules.

The Current Status box shows the type of transfer selected, indicates that the transfer is "In Progress," and displays a running count of records transferred until transfer is complete, at which time the total number of records updated will be displayed.

For a "Transfer From System Manager" request it is not necessary for the previous transfer to complete before requesting a different transfer. You may request a unit transfer immediately followed by group and site transfers, or any combination thereof, a popup screen will tell you that your request has been queued. It is also not necessary to remain in the screen from which the transfer was requested while the databases are being transferred. You may initiate the transfer and then proceed to another screen to perform some other action.

Close

Choose the **Close** button to exit the System Mgr/ Network Mgr Entity Database dialog box, if no other database transfers are desired, and return to the CEC/IMC Manager main window.

3.6.2 Transfer From CEC/IMC Manager

If a "Transfer From CEC/IMC Manager" is desired, all upload data will originate from the CEC/IMC Manager's hard disk. This is data stored from a previous System Manager upload. In addition, conventional and console unit ID databases can be uploaded from the CEC/IMC Manager. The conventional database is built using the Conv. Interface Adapter Configuration menu option from the VMIM menu (CEC/IMC Configuration). The console database is built using the Console User Profile menu option from the Console Configuration menu. A transfer will be aborted if a full transfer from the System Manager begins while the CEC/IMC Manager based transfer is in progress, or if a database file read error occurs. If a CEC/IMC Manager based transfer is in progress and a partial System Manager transfer occurs, the CEC/IMC Manager based transfer request will be "failed," CEC/IMC Manager requests are not queued. This is to allow other GUI clients an opportunity to submit requests.

In the Request box select Full for full upload, unlike System Manager transfers which allow partial transfer requests for units and groups, only full transfers are supported for CEC/IMC Manager based transfers. Select the desired database to be updated from any of the available options using the option buttons in the Entity box.

Choose the **Read Disk** button to request (read) the selected database files transferred from the CEC/IMC Manager hard disk.

Choose the **Send to CEC/IMC** button to broadcast the currently requested database transfer to the CEC/IMC interface modules.

The Current Status box will show the type of transfer selected, indicate that the transfer is "In Progress," and display a running count of records transferred until transfer is complete, at which time the total number of records updated will be displayed.

It is not necessary to remain in the screen from which the transfer was requested while the databases are being transferred. You may initiate the transfer and then proceed to another screen to perform some other action.

Close

Choose the **Close** button to exit the System Mgr/Network Mgr Entity Database dialog box, if no other database transfers are desired, and return to the CEC/IMC Manager main window.

3.7 TDM BUS CONFIGURATION

The CEC/IMC Digital Audio Switch is equipped with a Time Division Multiplexed (TDM) network which transfers audio signals, modem data signals, and user data signals throughout the switch. TDM network bus and time slot configurations are performed from the CEC/IMC Manager. These configurations set the CEC/IMC for 4- or 8-TDM bus operation and allocate a TDM time slot for each input channel. TDM time slot allocation procedures are described in the next section.

TDM bus configuration must match the specific hardware installed within the CEC/IMC, early CEC/IMC Audio Boards utilized only four (4) buses and all later Audio Boards utilize eight (8) buses. A CEC/IMC with 4-bus Audio Boards will not route signals correctly if the CEC/IMC is configured for eight buses. A CEC/IMC with 8-bus Audio Boards but configured for 4-bus operation will operate correctly; however, approximately one-half of the total TDM time slots will not be available. The 8-bus Audio Boards include 19D903302P1 Rev. F (and later) boards with 344A3561G3 (and later) firmware, and all 19D903302P3 boards. All T1/E1 Interface Cards are 8-bus capable.

NOTE

The MOM Controller Board default TDM bus setting is eight. This default number is established within the MOM firmware. If the MOM Controller's non-volatile RAM (NOVRAM) is cleared, the CEC/IMC will return to 8-bus operation without intervention from the CEC/IMC Manager. If 4-bus operation is required, the TDM bus configuration **must** be reset to the required number– 4 –after a MOM Controller Board NOVRAM clear. Refer to the diagnostic procedures within LBI-38938 for instructions on clearing Controller Board NOVRAM.

TDM bus allocations are performed from the TDM Bus Configuration dialog box, shown in Figure 11. From the CEC/IMC Manager menu bar select Configure System / CEC/IMC Configuration / TDM Bus to display the TDM Bus Configuration dialog box.

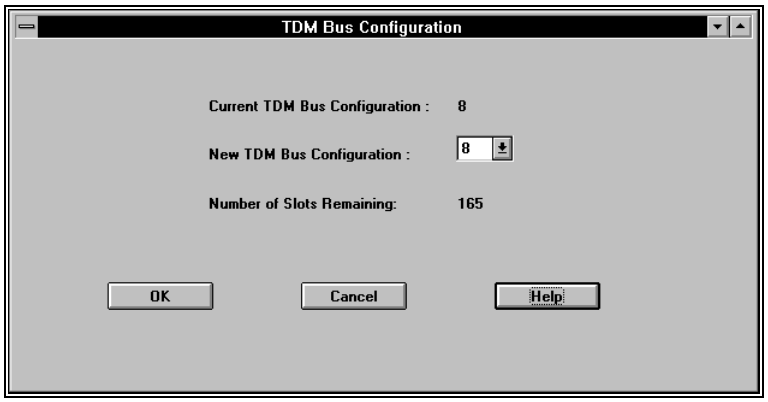


Figure 11 TDM Bus Configuration Dialog Box

Current TDM Bus Configuration
When the TDM Bus Configuration dialog box is first opened this field may be blank until the CEC/IMC Manager receives the current TDM Bus configuration from the CEC/IMC MOM Controller. The current TDM Bus configuration is then displayed in this read-only field. **TDM bus configuration must match the specific hardware installed within the CEC/IMC for proper and effective routing of audio signals**.

New TDM Bus Configuration
The number of TDM Buses the CEC/IMC will use to route audio signals is configured from this field. Select the required number of TDM Buses from the drop-down list box. **TDM bus configuration must match the specific hardware installed within the CEC/IMC for proper and effective routing of audio signals**.

Number of Slots Remaining
This read-only field displays the current number of TDM time slots available for assignment (allocation). This number will decrease as "site" channels are configured and allocated TDM time slots, conversely this number will increase as channels are "unconfigured." Changing the number of TDM Buses (above) will have a significant effect on the number of slots available; increasing the number of buses

will greatly increase the number of slots available, and decreasing the number of buses will greatly decrease the number of slots available.

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

Cancel

Choose the **Cancel** button to exit the TDM Bus Configuration dialog box without saving or activating any new settings.

OK

Choose the **OK** button to save any new settings, activate those settings, exit the TDM Bus Configuration dialog box and return to the CEC/IMC Manager main window.

3.8 SITE-TYPE INTERFACE MODULE CHANNEL CONFIGURATION

This section describes channel-related configurations applicable to "site"-type (MIM, NIM, VMIM, PIM and CTIM) interface modules that are performed at the CEC/IMC Manager. NIM, VMIM, PIM and CTIM site-type interface modules do not actually interface with EDACS trunked sites; however, each interface module is assigned a unique site assignment number (1 thru 32). Each interface module type will be discussed separately because, although similar, they do have slight differences and this is an important step in CEC/IMC switch setup. Also, some modules may be equipped with the new T1/E1 Interface Card (currently only MIMs, NIMs, and PIMs may be so equipped). Configuration of both Audio Board-equipped interface modules and T1/E1 Interface Card-equipped interface modules will be covered in those cases.

NOTE

In most cases, the term "site" in this program does not refer to an EDACS trunked site or any other type of radio system. It refers instead to a site-type interface module within the CEC/IMC or StarGate Controller Digital Audio Switch. The number that follows is the interface module's site assignment number. This number corresponds to and matches the site assignment number set by the 5-bit DIP switch setting on the interface module's Controller Board.

Prior to actual channel configuration the interface module to be configured must be selected. From the CEC/IMC Manager menu bar select Configure System / CEC/IMC Configuration / the desired interface module (MIM, NIM, VMIM, PIM or CTIM) from the CEC/IMC Configuration menu, shown in Figure 12. When an interface module is selected from the CEC/IMC Configuration menu the Site Channel Configuration List dialog box for that module is displayed.

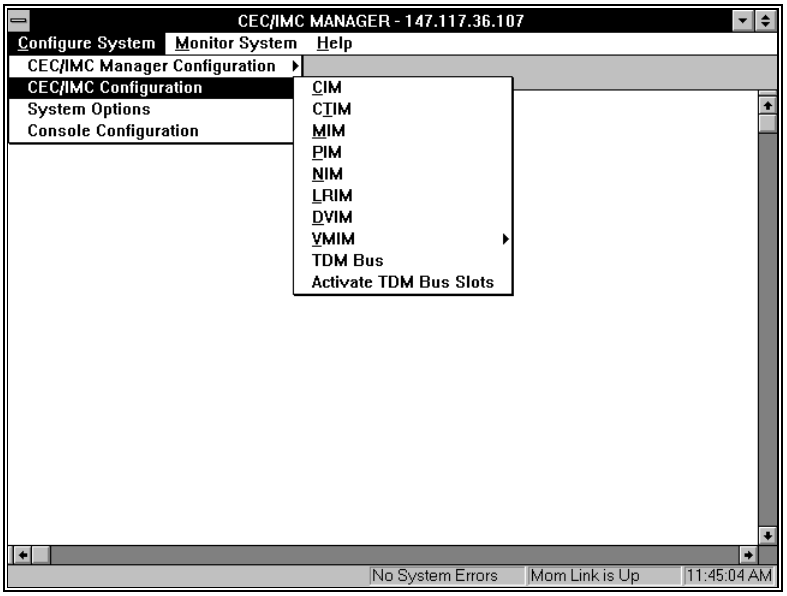


Figure 12 CEC/IMC Configuration Menu

3.8.1 MIM Channel Configuration

Interfacing between the CEC/IMC and an EDACS trunked site is accomplished with a **M**ASTR™ II/III **I**nterface **M**odule (**MIM**). The MIM consists of a Controller Board and up to eight Audio or T1/E1 Interface Boards. An optional standby Controller Board may be used with an EDACS trunked site for redundant downlink operation.

MIM "Site" Selection

Prior to actual channel configuration the interface module to be configured must be selected. Select MIM from the CEC/IMC Configuration menu. When an interface module is selected from this menu the Site Channel Configuration List dialog box for that module appears, Figure 13.

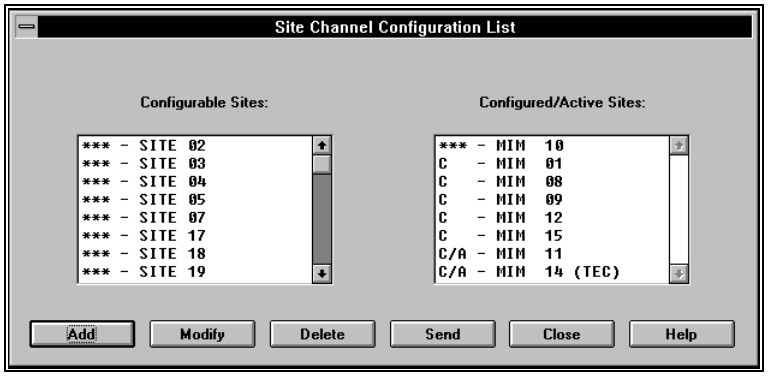


Figure 13 Site Channel Configuration List Dialog Box (MIM Shown)

Each Site Channel Configuration List dialog box displays the configurable "sites" and configured/active "sites." An active "site" represents an active Controller Board control data link. For example, in the case of a MIM this represents an operating link between an EDACS trunked site and the MIM Controller Board.

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

Configurable Sites:
The Configurable Sites list box displays all inactive unconfigured site-type interface modules. If a MIM appears in this box, no channel configuration exists at the CEC/IMC Manager and no active Controller Board control data link exists at the CEC/IMC for the corresponding site assignment number. Any number of these available MIMs may be selected at one time to be added to the Configured/Active list box for configuration.

Configured/Active Sites:
The Configured/Active Sites list box displays "sites" which have been added but not yet channel-configured, "sites" which have had previous channel configurations performed, and "sites" which have been previously channel-configured and have an active Controller Board control data link. Before a site-type interface module can be channel-configured, it must be listed in the Configured/Active Sites list box. Any number of the available "sites" in this list may be selected at one time for modification in the Site Channel Configuration dialog box.

All selected MIMs in this list will also be included in the "**Save As…**" dialog box that is accessed from the Site Channel Configuration dialog box or T1/E1 Digital Site Configuration dialog box. The particular state is indicated by a prefix as defined in the following table.

Table 1 Configured/Active Sites Prefix Definitions

PREFIX	MEANING
**	The "site" has been added for configuration but is not active and no channel configurations have been performed or saved.
A	The control data link is active and configuration data exists at the CEC/IMC (default values if nothing else) but not necessarily at the CEC/IMC Manager.
C	Channel configurations have been performed and saved for the "site" but the control data link is not active.
C/A	Channel configurations have been performed and saved for the "site" and the control data link is active.

Those site-type interface modules followed by "(TEC)" are T1/E1 Interface Card equipped and are configured as described in T1/E1 Interface Card-Equipped MIM Configuration, on page 3-35.

Add

Choose the **Add** button to move a selected site from the Configurable Sites list box and "add" it to the Configured/Active Sites list box, where it can now be selected for configuration. If upon adding a site, a configuration data file exists on the CEC/IMC Manager's hard disk drive from a previous add and delete, the site will be added to the Configured/Active Sites list box with its configuration data file (with a ** prefix). This previous configuration may be modified, saved, and sent as needed.

Modify

Choose the **Modify** button to display the Audio Interface Type dialog box, select either Audio Board or T1/E1 Interface Board as required by selecting the appropriate option button. Selecting Audio Board will activate the Site Channel Configuration dialog box, selecting T1/E1

Interface Board will activate the T1/E1 Digital Site Configuration dialog box. These options are discussed in detail in subsequent sections.

Delete

Choose the **Delete** button to remove ("delete") a selected configured or unconfigured site from the Configured/Active Sites list box to the Configurable Sites list box. Configured-and-active sites (C/A prefix) cannot be "deleted." This delete function does not remove "site" channel configuration files from the CEC/IMC Manager's hard disk drive. Therefore, if the "deleted" site is subsequently added back to the Configured/Active Sites list box using the **Add** button, the previous channel configuration is not lost (this configuration data must be re-saved in the Site Channel Configuration dialog box before it can be resent to the CEC/IMC).

Close

Choose the **Close** button to exit the dialog box and return to the main menu. Any "**" (unconfigured and unsaved) sites appearing in the Configured/Active Sites list box will be removed and returned to the Configurable Sites list box.

Audio Interface Type Selection

For those site-type interface modules that may be equipped with either an Audio Board or T1/E1 Interface Card (currently only MIMs, NIMs, and PIMs may be so equipped), the audio interface type must be selected before channel configuration can continue.

In the Site Channel Configuration List dialog box select the desired site-type interface modules to configure from the Configured/Active Sites list, or add the desired modules from the Configurable Sites list, if not already listed, as described earlier. Choose **Modify** to display the Audio Interface Type dialog box, select either the Audio Board option button or the T1/E1 Interface Board option button, then choose **OK** to continue. Choose the **Close** button to exit the Audio Interface Type dialog box and return to the Site Channel Configuration List dialog box.

Audio Board option

If Audio Board was selected (Figure 14), the Site Channel Configuration dialog box will be displayed. Continue with channel configuration as described in "Audio Board-Equipped Channel Configuration."

Figure 14 Audio Interface Type Dialog Box (Audio Board selected)

T1/E1 Interface option

If T1/E1 Interface Card was selected (Figure 15), a new set of option buttons will appear.

T1 is a digital transmission facility operating at 1.544 Mbps (million bits per second) in a full-duplex, time-division-multiplexing mode. T1 is the first level or primary rate within a digital transmission and switching hierarchy defined by AT&T called a T Carrier System. North America has adopted the T Carrier System as a standard for digital transmission of voice, data, and images. Time-division multiplexing permits the derivation of logical channels within the serial bit stream. The CEC/IMC T1/E1 Interface will allocate twenty-four 64 kbps T1 channels.

E1 digital transmission is very similar to T1. The major difference is in the bit rate. E1 is a digital transmission facility operating at 2.048 Mbps. The difference in bit rate allows for different channel allocation schemes. The CEC/IMC T1/E1 Interface will allocate thirty-one 64 kbps E1 channels. E1 transmission has been adopted as the digital transmission standard in European countries.

T1/E1 selection is performed at the CEC/IMC Manager on a CEC/IMC wide basis. Changing the line type will cause the entire T1/E1 database to be reset (lost) for all T1/E1 "sites." T1 or E1 selection is dependent upon the line service coming into the CEC/IMC (T1 and E1 lines are physically different), and as mentioned above, depends upon what part of the world you are in. Selecting T1 or E1 should only be required when the system is first configured, after that the current system configuration will be indicated when the Audio Interface Type dialog box appears on your screen and **changing line type is not necessary or desired**. Choose the **OK** button and the

T1/E1 Digital Site Configuration dialog box will appear. Continue with channel configuration as described in "T1/E1 Interface Card Equipped Configuration."

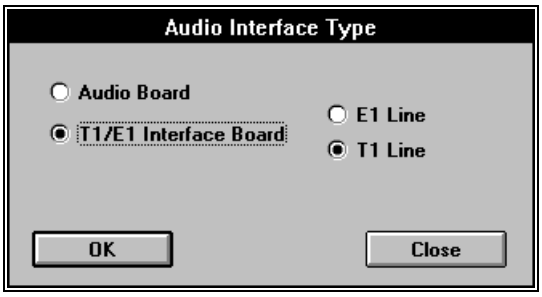


Figure 15 Audio Interface Type Dialog Box (T1/E1 Interface Card selected)

Audio Board-Equipped MIM Channel Configuration

This section describes configurations for channels within Audio Board-equipped site-type interface modules. All channel parameters are configured from the Site Channel Configuration dialog box, Figure 16. Only those "sites" which were selected in the Site Channel Configuration List dialog box are available for channel configuration. The selected sites are displayed in a list box at the top center of the dialog box.

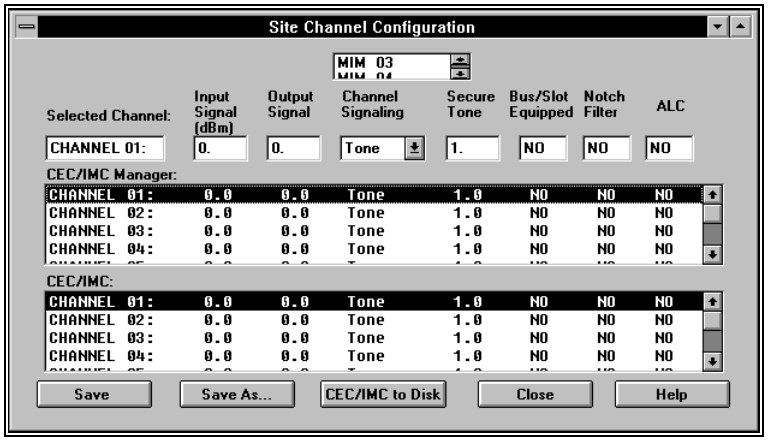


Figure 16 Site Audio Channel Configuration Dialog Box (MIM Shown)

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

View Current CEC/IMC Manager Channel Configuration

The upper list box in the Site Channel Configuration dialog box, labeled "CEC/IMC Manager," displays the current channel configurations stored on the CEC/IMC Manager hard disk for the currently selected site-type interface module. As the edit fields above this list box are modified for a selected channel, the changes will also appear in this list box.

View Current CEC/IMC Channel Configuration

The lower list box in the Site Channel Configuration dialog box, labeled "CEC/IMC," displays the current channel configurations stored at the CEC/IMC for the currently selected site-type interface module. Information within this box updates only after **Send** is performed from the preceding Site Channel Configuration List dialog box.

CEC/IMC to Disk

Choose the **CEC/IMC to Disk** button to write the current CEC/IMC configuration data to the CEC/IMC Manager hard disk. This action will overwrite the current CEC/IMC Manager configuration for the selected interface module. This function is useful if the CEC/IMC Manager configuration database is lost for any reason. A difference between CEC/IMC and CEC/IMC Manager databases will be evident

by comparing the CEC/IMC Manager and CEC/IMC list boxes in the Site Channel Configuration dialog box. Ensure that the CEC/IMC configuration is correct, then choose the **CEC/IMC to Disk** button to restore the CEC/IMC Manager configuration database (for the selected interface module).

Channel Selection
Select a channel (1 thru 32) for configuration from the CEC/IMC Manager list box, only one channel may be selected at a time. The selected channel and its configuration data will be displayed in the edit fields above the CEC/IMC Manager list box.

Input Signal Level (dBm)
This setting establishes the signal level in dBm (600-ohm impedance; 0 dBm = 1 milliwatt) applied to the selected channel's line input. Enter (type) the required value in the text box. The setting should be equal to the voice peak (test tone) level applied to the channel's line input. Voice peak levels are +10 dBm greater than average voice levels. Valid range is -25.0 dBm to 12.0 dBm, adjustable in 0.5 dBm increments. The program automatically rounds-off non-0.5 dBm fractional entries to the nearest 0.5 dBm point. Input Signal Level default = 0 dBm.

NOTE

If Automatic Level Control (ALC) is disabled for the selected channel, subtract 1.5 dBm from the required Input Signal Level setting. For example, if the required input signal level is -10 dBm, enter -11.5 dBm. ALC is disabled by setting the ALC text box to "NO."

LBI-38938 contains a line level adjustment overview section which contains general information and general recommendations for both input and output level settings.

Output Signal Level (dBm)
This setting establishes the signal level in dBm (600-ohm impedance; 0 dBm = 1 milliwatt) sent out by the selected channel's line output. The setting specifies the voice peak (test tone) level sent out by the channel. The valid range is -25.0 dBm to 13.0 dBm, generally in 0.5 dBm increments, select the required value from the drop-down list box. Output Signal Level default = 0 dBm.

Channel Signaling
This drop-down list box specifies the type of channel signaling sent out by the selected channel for control of external equipment such as an EDACS trunked site or co-located mux equipment. Valid settings are "NONE" for no signaling, "TONE" for tone control signaling, "E&M" for M-lead control signaling, and "BOTH" for both tone and M-lead control signaling. Channel Signaling default = "NONE."

EDACS trunked sites require specialized tone control signaling for transmit keying. For a MIM, all utilized channels require either a "TONE" or a "BOTH" setting. Specific tone level settings are accomplished via the "Secure Tone" text box described in the following section.

Secure Tone
This setting establishes the level of the 2175 Hz secure tone and transmit hold tone sent out by the Audio Board's channel prior to and during a switch-to-site transmission. The set level is only utilized if Channel Signaling is "TONE" or "BOTH." Valid range is -10 dBm to 11 dBm, which specifies the secure tone level. The 2175 Hz transmit hold tone is always sent out 30 dBm below the secure tone setting.

NOTE

The secure tone and transmit hold tone are set on a per Audio Board basis. For example, setting channel 2 equal to 5 dBm will simultaneously set channels 1, 3 and 4 equal to 5 dBm.

Unlike conventional base stations, EDACS trunked site base stations do not require a function tone for proper transmit keying. Therefore, the presence of a function tone is not guaranteed and no longer specified for MIMs.

Bus/Slot Equipped
All utilized channels within an interface module must be allocated a time slot on the CEC/IMC TDM network. Allocate a time slot to the selected channel by setting Bus/Slot Equipped to "YES." A channel will not route audio correctly if is not allocated a time slot. Set all unused channels to "NO," the default setting.

For example, if the currently selected site-type interface module is a 20-channel MIM with five (5) Audio Boards addressed 1 thru 5, Bus/Slots Equipped for channels 1 thru 20 must be "YES."

NOTE

In earlier CEC/IMC firmware/software releases, slot allocations could only be made contiguously starting with channel one (1). In some systems this produced slot allocation inefficiencies, i.e., some slots had to be allocated but were never used. CEC/IMC software/firmware release 5.0 (and later) provides non-contiguous slot allocations. In this release, only those slots actually required need be allocated. For example, channels 1 and 4 can be allocated slots without allocating slots to channels 2 and 3.

Notch Filter

CAUTION

DO NOT enable the 2175 Hz Notch Filter for any channel if the respective Audio Board part number is 19D903302P1 (any revision).

Each Audio Board channel is equipped with a 2175 Hz notch filter circuit which when enabled eliminates destructive interference of the channel's 2175 Hz transmit keying tone. In some cases, this destructive interference or "talk down" can cause incorrect (early) trunked site channel drops. To enable the selected channel's notch filter, enter "YES" in the Notch Filter text box. Notch Filter default = "NO" (disabled).

ALC

CAUTION

DO NOT enable ALC for any channel if the respective Audio Board part number is 19D903302P1 (any revision).

Automatic Level Control (ALC) provides compensation for signal level variances in a channel line input signal. As required, enable ALC for

the selected channel by entering "YES" in the ALC text box or disable it by entering "NO."

Save and Send MIM Audio Board Configurations

When channel configuration of the selected interface module is complete, the Site Channel Configuration dialog box changes must be sent to the CEC/IMC before the changes will take effect. This reprograms the MIM Controller Boards. However, it is important to save the new configuration prior to sending it to the CEC/IMC because a send will send the last configuration that was saved to disk; saving first ensures that the actual CEC/IMC channel configuration will be the same as the channel configuration stored on the CEC/IMC Manager hard disk. To save and send configurations, action is required first in the Site Channel Configuration dialog box and then in the Site Channel Configuration List dialog box.

Site Channel Configuration dialog box

Save

Choose the **Save** button to perform an immediate save of the currently selected site-type interface module's channel configuration. Other "sites" displayed in the list box located at the top of the dialog box are not saved. This channel configuration is saved on the CEC/IMC Manager's hard disk drive. Any previous channel configuration for the "site," if present, is erased and replaced with the current channel configuration. If the CEC/IMC Manager is running remotely or as a part of the EDACS Network Manager, this configuration is saved on the CEC/IMC Manager server, typically local to the CEC/IMC; it is not saved at the remote location.

Save As...

Choose the **Save As…** button to allow the currently selected site-type interface module channel configurations to be saved as a different site-type interface module. It is provided to speed configurations when similar MIM configurations are required. Upon choosing **Save As…** a small dialog box, Figure 17, will appear which allows entry of a new MIM number. Select the desired MIM number from one of the choices in the drop-down list box, the choices listed are the selected MIMs in the Configured/Active Sites list box. Like **Save**, **Save As…** stores channel configuration on the CEC/IMC Manager server.

Figure 17 "Save As…" Dialog Box

For example, if "Site 8" is the currently selected site-type interface module and "Site 12" requires similar configuration settings, this button may be used to save the "Site 8" configuration as "Site 12" (save to "12"). The new "site" may then be changed later, as required, by selecting it from the selection list box, changing the configuration as required, and then choosing **Save**.

Close

Choose the **Close** button to exit the Site Channel Configuration dialog box and enter the Site Channel Configuration List dialog box. If any changes have been made and not saved, you will be prompted (Write Changes to Disk?) to save and exit (**Yes**), exit without saving (**No**), or cancel the **Close** command and remain in the dialog box (**Cancel**).

Site Channel Configuration List dialog box

Send

Choose the **Send** button to send the site channel configuration data to the respective interface module. This procedure must be performed before the interface module will operate with the new configuration. Only configured and configured-and-active (C and C/A prefixes) configurations may be sent. All configuration data is sent to the MOM Controller Board; the Audio configuration is sent directly out from there to the respective interface module Controller Board. A "Send to Site Successful" message will be received to confirm that the data was received by the interface module Controller Board. Bus Slot configuration data is compared to the current configuration at the CEC/IMC Manager; if different, it is sent to the MOM Controller Board (if not, no further action is taken by the system) and when the

MOM Controller Board receives this new data it will send an acknowledgment message back to the CEC/IMC Manager, which will then display the confirmation box: "Do you want to activate TDM Bus Slots? OK - will cause all CTRL boards to reset." Choose **OK** to activate TDM Bus Slots (resetting Controller Boards) with the new Bus Slot configuration data, choose **Cancel** to not activate TDM Bus Slots with the new Bus Slot configuration data (keeping the previous configuration) and return to the Site Channel Configuration List dialog box.

Close

Choose the **Close** button to exit the Site Channel Configuration List dialog box and return to the CEC/IMC Manager main window. Any "**" (unconfigured and unsaved) sites appearing in the Configured/Active Sites list box will be removed and returned to the Configurable Sites list box.

T1/E1 Interface Card-Equipped MIM Configuration

This section describes configuration for channels of T1/E1 Interface Card-equipped interface modules (currently only MIMs, NIMs, and PIMs are so equipped). Channel configurations are performed from the T1/E1 Digital Site Configuration dialog box (Figure 18) and from the T1/E1 Interface Card Auto-configuration dialog box (Figure 19). As was the case with Audio Board-equipped site-type interface modules, only those "sites" which were selected in the Site Channel Configuration List dialog box are available for channel configuration.

NOTE

Like the CEC/IMC Audio Board, each T1/E1 Interface Card within a CEC/IMC interface module must have a unique board address setting. This address is 1 - 8 (addresses 2 - 8 are currently not available).

NOTE

T1/E1 selection is performed at the CEC/IMC Manager on a CEC/IMC wide basis. Changing the Line Type will cause the complete T1/E1 database to be reset (lost). The Line Type shown as the "default" when the Audio Interface Type dialog box appears is how the system is configured and Line Type should not be changed.

The T1/E1 Interface Card provides a built-in T1 or E1 port for CEC/IMC interface modules. This port allows direct interfacing to T1/E1 microwave, fiber-optic, or leased lines facilities. Consequently, co-located T1/E1 multiplexing (mux) equipment at the CEC/IMC is eliminated when the T1/E1 Interface Card is employed. CEC/IMC Audio Boards are also eliminated within the particular interface module. Within each of these interface modules, one or more T1/E1 Interface Cards replace all Audio Boards. The T1/E1 Interface Card furnishes twenty-four full-duplex T1 channels in T1 mode and thirty-one full-duplex E1 channels in E1 mode. In addition to its T1/E1 port, the T1/E1 Interface Card also contains eight subrate ports which, depending upon board configuration, can provide modem-less data links over spare T1/E1 channels to either internal or external devices. Some, all, or none of these ports can be utilized depending on board configuration. Five of the subrate ports support synchronous or asynchronous data links and the remaining three are synchronous-only ports.

T1/E1 Digital Site Configuration

Networked Systems Considerations

Any system nodes that are connected using T1/E1 Interfaces must remain frequency locked at all times. The T1/E1 Interface design allows for total network synchronization by offering the following CEC/IMC Configuration options. Each of these options are selectable by configuration of both the Clock Boards and the T1/E1 Interface Cards.

1. Master - Redundant Clock Circuits generated by the Clock Board in a FREE RUN mode. This allows any CEC/IMC to become the master source of Network timing. All nodes connected to this CEC/IMC will be in the slave mode. This mode is established by setting the Clock Board DIP switches to "Master" mode and all the T1/E1 Interface Cards' Slave Clock option to "NONE."

2. T1/E1 Slave - Redundant Clock Circuits generated by the Clock Board synchronized to 1 (or 2 with redundancy) T1/E1 Interface into the CEC/IMC. The CEC/IMC can be slaved to an external node that is connected through a T1/E1 link, and no additional timing source is needed. Timing from the T1/E1 line is passed to the Clock Board from the T1/E1 Interface Cards through a redundant set of synchronization clocks named Slave A and Slave B. Each T1/E1 Interface Card can provide Slave A, B or A&B. This mode is established by setting the Clock Board DIP switches to "Slave to 8kHz" and 1 T1/E1 Interface Card Slave Clock option set to "SLAVE A," with another set to "SLAVE B" for redundancy, or 1 T1/E1 Interface Card set to "SLAVE A&B" for no redundancy.

3. Slave to external 1.544 MHz - Redundant Clock Circuits generated by the Clock Board synchronized to 1 (or 2 with redundancy) external clock source. Any CEC/IMC can be synchronized to the timing output from a T1/E1 multiplexer, microwave radio, fiber network, etc. Connect the external timing source to both Clock Boards in the CEC/IMC for redundancy. This mode is established by setting the Clock Board DIP switches to "Slave to Ext. 1544 kHz" and all T1/E1 Interface Cards' Slave Clock option to "NONE."

4. Slave to external 2.048 MHz (E1 mode only) - Redundant Clock Circuits generated by the Clock Board synchronized to 1 (or 2 with redundancy) external clock source. Any CEC/IMC can be synchronized to the timing output from a T1/E1 multiplexer, microwave radio, fiber network, etc. Connect the external timing source to both Clock Boards in the CEC/IMC for redundancy. This mode is established by setting the Clock Board DIP switches to "Slave to 2048 kHz" and all T1/E1 Interface Cards' Slave Clock option to "NONE."

The following configuration guidelines must be followed for network synchronization:

1. One node in the system must be the MASTER source of network timing. The CEC/IMC will support a primary and redundant (or alternate) MASTER sources of timing as indicated above.
2. A MASTER node can be defined as a site, a Jessica, a T1/E1 link, or a CEC/IMC.
3. All leased T1/E1 facilities from the telephone company are frequency locked by the phone company. If there are any phone company T1/E1 connections, one of the connections must be the MASTER source of timing. Any other phone company connections may be the redundant MASTER source of timing. Phone company T1/E1 connections include leased lines for sites/multinode and T1/E1 connections through an MD110 (Jessica).
4. Any nodes using analog interfaces (including analog connections from an MD110 to the phone company) may be disregarded for synchronization purposes.
5. If a node is not a MASTER timing node, it must be slaved to the T1/E1 link going towards the MASTER node.

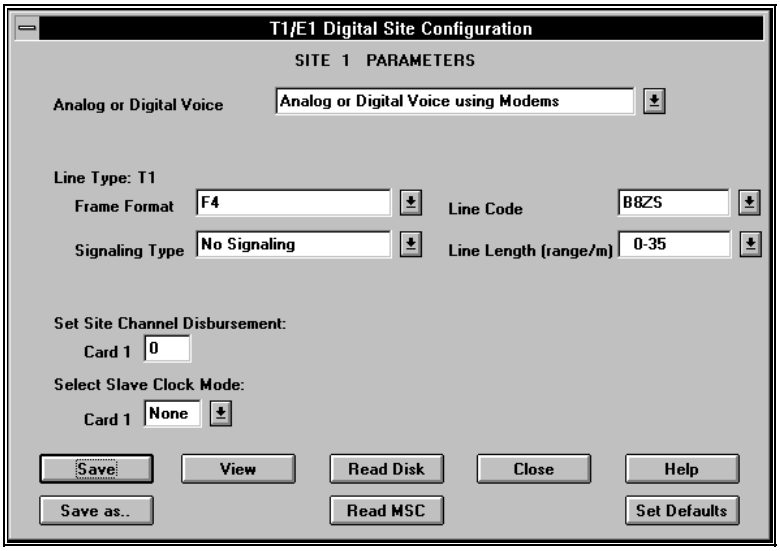


Figure 18 T1/E1 Digital Site Configuration Dialog Box (T1 Line Type Selected)

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

Analog or Digital Voice

In addition to T1 or E1 selection, T1/E1 Interface Card configuration includes selecting one of three primary board operating modes:

– **Analog/modem mode ("Analog or Digital Voice using Modems")**

  In the analog/modem mode, the T1/E1 Interface Card transfers PCM-encoded signals between the CEC/IMC TDM network and the T1/E1 line. PCM-encoded signals transferred by this mode include analog (clear) voice, modem-encoded digital voice, and/or modem-encoded data signals. In this mode each site channel is assigned to a T1/E1 channel. In addition, this mode allows use of the T1/E1 Interface Card subrate ports if T1/E1 channels are available after site channel assignments.

  Two CEC/IMC TDM bus slots coincide to one full duplex T1/E1 Channel. This is exactly analogous to a CEC/IMC Audio Board channel where two TDM bus slots coincide to

one full duplex 4-wire 600-ohm audio channel provided by the Audio Board. The T1/E1 Interface Card extracts a signal from one bus slot and sends it out on a T1/E1 channel. Accordingly, signals received on this same T1/E1 channel are applied to a different CEC/IMC TDM bus slot.

- **Digital voice/data using subrate ports mode (currently not supported)**
- **Digital voice/data using T1/E1 mode (currently not supported)**

Line Type
This is a read-only field which indicates which type of line (T1 or E1) that the system is configured for.

Frame Format
Framing deals with how the digitized data stream is configured (formatted), a data stream with one framing format would not be recognized by a system with another frame format. The possible T1 formats are 4-Frame Multiframe (F4), 12-Frame Multiframe (F12, D3/4), Extended Superframe (ESF), and Remote Switch Mode (F72). The possible E1 formats are Doubleframe and CRC Multiframe. The format is determined by the service line used. Select from the available choices in the drop-down list box to match the line format.

Line Code
The line code indicates the method used to encode long strings of zeroes. The receiving end of a T1/E1 link would not be able to remain in sync if long strings of zeroes were transmitted. The possible T1 line codes are B8ZS and AMI w/ZCS. The E1 line code is HDB3. The line code also is determined by the service line utilized. Select from the available choices in the drop-down list box to match the line.

Signaling Type
This signaling is used by the T1/E1 Interface Card to transmit channel status information (busy or idle). T1 uses bits robbed from the channel data to convey this information. E1 uses a dedicated channel to send signaling information for all channels; therefore, only 30 user channels are allowed. In a CEC/IMC system, signaling must be set for MIM site interfaces, and the T1/E1 muxes and base stations at the associated site location must be configured for E&M Signaling unless the site is all digital (no analog voice). Signaling should not be set for any other device types. The types of signaling are No Signaling (both T1 and

E1), Robbed Bit for T1, and CAS-CC for E1. Select the signaling type from the drop-down list box.

Line Length
This is the distance between the CEC/IMC and the device at the other end of the T1 line, which could be a microwave transceiver, a mux in co-located site equipment, CSU, etc. Line effects change the signal slightly, and the changes become more pronounced the further the signal travels down the line. The outgoing original signal is modified based upon line length so that the signal arriving at the destination closely resembles an ideal signal. Select the line length from the drop-down list box for T1 applications. E1 applications do not support selectable line lengths.

Set Site Channel Disbursement
The Set Site Channel Disbursement field sets the number of channels assigned to the indicated T1/E1 Interface Card. Enter the number of channels in the text box (1 - 24 for T1 or 1 - 31 for E1).

Select Slave Clock Mode
Selecting the Slave Clock Mode is part of a higher level system design, as mentioned earlier. Any system nodes that are connected using T1/E1 Interfaces must remain frequency locked at all times. The T1/E1 Interface design allows for total network synchronization through different CEC/IMC configuration options. A detailed discussion of the higher level system configuration is beyond the scope of this topic; however, for a more detailed discussion refer to *T1/E1 Interface Release Notes* (350A1909) and *CEC/IMC Digital Audio Switch Installation, Set-up, and Troubleshooting* (LBI-38938). Select the required clock mode from the drop-down list box.

Choose the **View** button to display the T1/E1 Interface Card Auto-configuration dialog box, which shows the T1/E1 channels and subrate port configurations.

Choose the **Read Disk** button to view the currently stored configuration on the CEC/IMC Manager hard disk. This normally should be the same as the actual configuration at the CEC/IMC.

Choose the **Read MSC** button to view the actual configuration at the CEC/IMC (stored in the interface module's NOVRAM). This normally

should be the same as the configuration stored on the CEC/IMC Manager hard disk. If the CEC/IMC Manager hard disk data was cleared or reset to undesired values, **Read MSC** followed by **Save** will restore the CEC/IMC Manager hard disk configuration.

Set Defaults

Choose the **Set Defaults** button to select the pre-programmed default values from the CEC/IMC Manager hard disk. These values will replace any currently displayed values; however, these "new" values must be saved and sent before they will become the new configuration.

T1/E1 Interface Card Auto-configuration

Subrate ports and channel assignments are auto-configured by the CEC/IMC Manager according to the number of free T1/E1 channels. In Figure 19, the T1/E1 Interface Card Auto-configuration dialog box is shown. Although there are no user configurable fields in this dialog box, the assignment of subrate ports and T1/E1 channels can be viewed on a per card basis in this dialog box. Select the card to view from the drop-down list box in the top left corner.

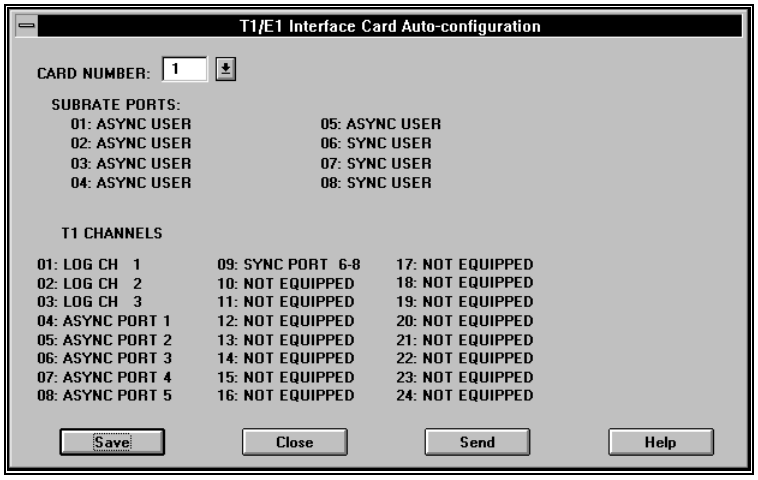


Figure 19 T1/E1 Interface Card Auto-configuration dialog box (T1 Line Type Selected)

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

T1/E1 Channel Assignment

T1/E1 logical channels are assigned starting with channel 1, these are the channels used to transmit voice, data, and image signals from one system node to another. E1 channel 16 is used for signaling if signaling is enabled. (See "Signaling Type" under T1/E1 Digital Site Configuration above.) Subrate ports for user data are assigned channels adjacent/after logical channels according to the table below. Asynchronous (async) ports, up to 5, are assigned first and then synchronous (sync) ports are assigned.

Table 2 Subrate Port Assignments for Analog/Modem Mode

Free Channels (Per Card)	Subrate Port Auto-configuration*
0	no subrate ports available
1	port 1 = async ports 2 - 8 = not available
2	port 1 = async ports 2 - 5 = sync ports 6 - 8 = not available
3	ports 1 & 2 = async ports 3 - 5 = sync ports 6 - 8 = not available
4	ports 1 - 3 = async ports 4 & 5 = not available ports 6 - 8 = sync
5	ports 1 - 4 = async port 5 = not available ports 6 - 8 = sync
>5	ports 1 - 5 = async ports 6 - 8 = sync

* "sync" = subrate port set for synchronous operation
"async" = subrate port set for asynchronous operation

Subrate Port Channel Assignment

Asynchronous subrate ports require an individual channel assignment for each port, however, up to five synchronous subrate ports can be packed in one T1/E1 channel using DS0B subrate multiplexing. Based on hardware considerations at the T1/E1 Interface Card, sync ports 1 - 5 and 6 - 8 would be packed in pre-assigned DS0B "sub-channels" as shown below.

← DS0 →				
subchannel 1	subchannel 2	subchannel 3	subchannel 4	subchannel 5
1	2	3	4	5
	6	7	8	

Table 3 Synchronous Subrate Port Packing Arrangement

Save And Send MIM T1/E1 Configurations

Any T1/E1 Digital Site Configuration dialog box or T1/E1 Interface Card Auto-configuration dialog box changes must be sent before the changes will come into effect at the CEC/IMC. This reprograms the MIM Controller Boards and T1/E1 Interface Cards. The new configurations must be saved before sent to the CEC/IMC, if sending is attempted before saving a "Site data must be saved to disk prior to send" message box will appear. Save and send may be performed either from the T1/E1 Interface Card Auto-configuration dialog box only, or from the Site Channel Configuration List dialog box, similar to Audio Board save and send.

T1/E1 Interface Card Auto-configuration dialog box

Save

Choose the **Save** button to perform an immediate save of the currently selected site-type interface module's channel configuration. The channel configuration is saved on the CEC/IMC Manager's hard disk drive. Any previous channel configuration for the "site," if present, is erased and replaced with the current channel configuration. If the CEC/IMC Manager is running remotely or as a part of the EDACS Network Manager, this configuration is saved on the CEC/IMC Manager server, typically local to the CEC/IMC; it is not saved at the remote location.

Send

Choose the **Send** button to send the T1/E1 site channel configuration data to the respective interface module. This procedure must be performed before the interface module will operate with the new configuration. Only configured and configured-and-active (C and C/A prefixes) configurations may be sent. All configuration data is sent to the MOM Controller Board; the T1/E1 configuration is sent directly out from there to the respective interface module Controller Board. A

"Send to Site Successful" message will be received to confirm that the data was received by the interface module Controller Board. Bus Slot configuration data is based on the channel assignment in the Set Site Channel Disbursement field (one bus slot per channel assigned) and is compared to the current configuration at the CEC/IMC Manager; if different, it is sent to the MOM Controller Board (if not, no further action is taken by the system) and when the MOM Controller Board receives this new data it will send an acknowledgment message back to the CEC/IMC Manager, which will then display the confirmation box: "Do you want to activate TDM Bus Slots? OK - will cause all CTRL boards to reset." Choose **OK** to activate TDM Bus Slots (resetting Controller Boards) with the new Bus Slot configuration data, choose **Cancel** to not activate TDM Bus Slots with the new Bus Slot configuration data (keeping the previous configuration) and return to the T1/E1 Interface Card Auto-configuration dialog box.

T1/E1 Digital Site Configuration dialog box

Choose the **Save** button to perform an immediate save of the currently selected site-type interface module's channel configuration. This channel configuration is saved on the CEC/IMC Manager's hard disk drive. Any previous channel configuration for the MIM, if present, is erased and replaced with the current channel configuration. If the CEC/IMC Manager is running remotely or as a part of the EDACS Network Manager, this configuration is saved on the CEC/IMC Manager local to the CEC/IMC; it is not saved at the remote location.

Choose the **Save As…** button to allow the currently selected site-type interface module channel configurations to be saved as a different site-type interface module. It is provided to speed configurations when similar MIM configurations are required. Upon choosing **Save As…** a small dialog box, similar to Figure 17 on page 3-34, will appear which allows selection of a new MIM number. Select the desired MIM number from one of the choices in the displayed list, the choices displayed are the selected MIMs in the Configured/Active Sites list box. Like **Save**, **Save As…** stores channel configuration on the CEC/IMC Manager server.

Choose the **Close** button to exit the T1/E1 Digital Site Configuration dialog box. If any changes have been made and not saved, a prompt

will appear to warn of the unsaved changes and the user will be given the opportunity to save and exit (**Save**) or exit without saving the changes (**Cancel**).

Site Channel Configuration List dialog box

Send

Choose the **Send** button to send the T1/E1 site channel configuration data to the respective interface module. This procedure must be performed before the interface module will operate with the new configuration. Only configured and configured-and-active (C and C/A prefixes) configurations may be sent. All configuration data is sent to the MOM Controller Board; the T1/E1 configuration is sent directly out from there to the respective interface module Controller Board. A "Send to Site Successful" message will be received to confirm that the data was received by the interface module Controller Board. Bus Slot configuration data is based on the channel assignment in the Set Site Channel Disbursement field (one bus slot per channel assigned) and is compared to the current configuration at the CEC/IMC Manager; if different, it is sent to the MOM Controller Board (if not, no further action is taken by the system) and when the MOM Controller Board receives this new data it will send an acknowledgment message back to the CEC/IMC Manager, which will then display the confirmation box: "Do you want to activate TDM Bus Slots? OK - will cause all CTRL boards to reset." Choose **OK** to activate TDM Bus Slots (resetting Controller Boards) with the new Bus Slot configuration data, choose **Cancel** to not activate TDM Bus Slots with the new Bus Slot configuration data (keeping the previous configuration) and return to the Site Channel Configuration List dialog box.

Close

Choose the **Close** button to exit the Site Channel Configuration List dialog box and return to the CEC/IMC Manager main window. Any "**" (unconfigured and unsaved) sites appearing in the Configured/Active Sites list box will be removed and returned to the Configurable Sites list box.

3.8.2 NIM Channel Configuration

Two or more IMC networks can be linked together for "distributed multisite" communications using a **N**etwork **I**nterface **M**odule (**NIM**) at each IMC switch. NIM links are communication gateways that support a limited amount of communication traffic between network switches.

Each NIM is assigned a unique site assignment number (1 thru 32) within the CEC/IMC. This number corresponds to and matches the site assignment number set via the 5-bit DIP switch setting on the interface module's Controller Board. A NIM may be either Audio Board equipped or T1/E1 Interface Card equipped, both situations will be discussed.

Multinode Configuration

NOTE

For this discussion the term "multinode" will be synonymous with distributed multisite network involving multiple IMC networks connected together by Network Interface Modules (NIMs).

Some additional configuration considerations are required when linking two or more IMC networks together for multinode operation. The NIM control data link between the IMC networks must be established prior to NIM channel audio configuration. The NIM on each end of the link must be manually set to equal baud rates; this is performed in the StarGate / Remote CEC / NIM Configuration dialog box as described in DISTRIBUTED MULTISITE / STARGATE CONFIGURATION, beginning on page 3-141. Those nodes (IMC networks) that will make-up the multinode system must have their Group and Unit Databases downloaded from the System Manager. This is accomplished by downloading the System Manager Group and Unit Databases from the System Manager as discussed in SYSTEM MANAGER DATABASE UPLOADS, beginning on page 3-14, and may have already been accomplished during the course of normal CEC/IMC configuration. At the very least the Group and Unit Database download should be verified as being complete.

The CEC/IMC ID ("switch assignment number") must be set at the MOM Controller Board before distributed multisite (multinode) communications will operate correctly. The CEC/IMC firmware will automatically display a CEC/IMC ID number even if one is not set at the MOM; therefore, a displayed CEC/IMC ID does not guarantee that the number has been set. Ensure that this switch assignment number has been set using the DIP switches on the MOM Controller Board as specified in the Distributed Multisite/StarGate Configuration section of

LBI-38938, *CEC/IMC Digital Audio Switch Installation, Set-up, and Troubleshooting.*

NIM "Site" Selection

Prior to actual channel configuration, the interface module to be configured must be selected. From the CEC/IMC Manager menu bar select Configure System / CEC/IMC Configuration / NIM to display the Site Channel Configuration List dialog box for that module.

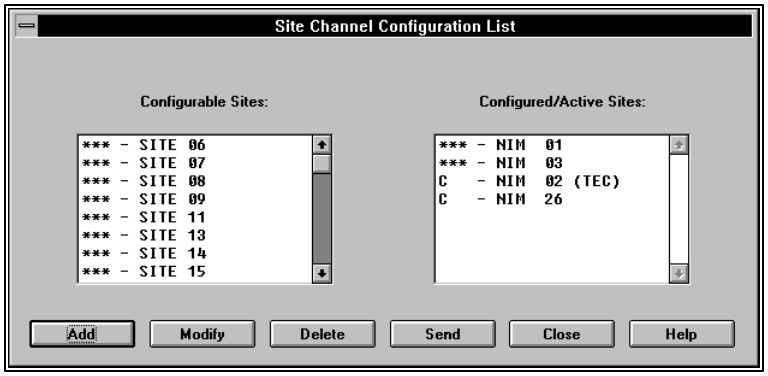


Figure 20 NIM Site Channel Configuration List Dialog Box

Each Site Channel Configuration List dialog box displays the configurable NIMs and configured/active NIMs. A configured and active NIM represents an active operating control link between the NIM Controller Boards in two networked CEC/IMC switches.

Help

Choose the **Help** command button to access the Help function. (Help is also available by pressing the **F1** key.)

Configurable Sites:
The Configurable Sites list box displays all inactive unconfigured site-type interface modules. If a NIM appears in this box, no channel configuration exists at the CEC/IMC Manager and no active Controller Board control data link exists at the CEC/IMC for the corresponding site assignment number, and the NIM may be selected for configuration. Any number of these available NIMs may be selected at one time to be added to the Configured/Active list box for configuration.

Configured/Active Sites:
The Configured/Active Sites list box displays NIMs which have been added but not yet channel-configured, NIMs which have had previous channel configurations performed, and NIMs which have been previously channel-configured and have an active Controller Board control data link. Before a site-type interface module can be channel-configured, it must be listed in the Configured/Active Sites list box. Any number of the available NIMs may be selected at one time for modification in the Site Channel Configuration dialog box. All selected NIMs in this list will also be included in the "**Save As...**" dialog box that is accessed from the Site Channel Configuration dialog box or the T1/E1 Digital Site Configuration dialog box. See Table 1 for Configured/Active Sites Prefix Definitions on page 3-25 if necessary.

Add

Choose the **Add** button to move a selected NIM from the Configurable Sites list box and "add" it to the Configured/Active Sites list box where it can be selected for configuration. If upon adding a NIM, a configuration data file exists on the CEC/IMC Manager's hard disk drive from a previous add and delete, the NIM will be added to the Configured/Active Sites list box with its configuration data file (with a ** prefix). This previous configuration may be modified, saved, and sent as needed.

Delete

Choose the **Delete** button to remove ("delete") a selected configured or unconfigured NIM from the Configured/Active Sites list box to the Configurable Sites list box. Configured-and-active NIMs cannot be "deleted." This delete function does not remove NIM channel configuration files from the CEC/IMC Manager's hard disk drive. Therefore, if the deleted NIM is subsequently added back to the Configured/Active Sites list box using the **Add** button, the previous channel configuration is not lost (this configuration data must be re-saved in the Site Channel Configuration dialog box before it can be resent to the CEC/IMC).

Modify

Choose the **Modify** button and the Audio Interface Type dialog box will be presented, select either Audio Board or T1/E1 Interface as required by clicking the appropriate option button. Selecting Audio Board will activate the Site Channel Configuration dialog box,

selecting T1/E1 Interface will activate the T1/E1 Digital Site Configuration dialog box. These options are discussed in detail in subsequent sections.

Audio Board Equipped NIM Configuration

This section describes configurations for channels within Audio Board-equipped NIMs. All channel parameters are configured from the (NIM) Site Channel Configuration dialog box, Figure 21. Only those NIMs which were selected in the Site Channel Configuration List dialog box are available for channel configuration. Select the desired NIMs to configure from the Configured/Active Sites list, or add the desired NIMs from the Configurable Sites list, if not already listed, as described earlier. Choose **Modify** and the Audio Interface Type dialog box, Figure 14 on page 3-27, will be displayed, select the Audio Board option, then choose **OK** to display the Site Channel Configuration dialog box, Figure 21. The selected NIMs are displayed in a list box at the top center of the dialog box. Audio Board-equipped NIMs require less settings than Audio Board-equipped MIM, VMIM and PIM interface modules.

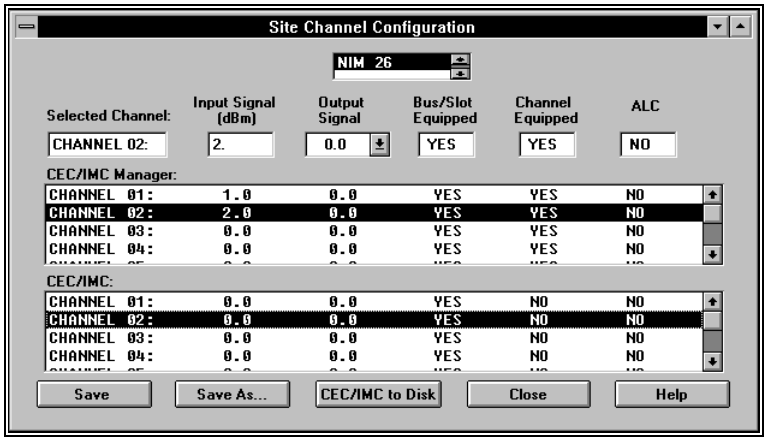


Figure 21 NIM Site Channel Configuration Dialog Box

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

View Current CEC/IMC Manager Channel Configuration
The upper list box in the Site Channel Configuration dialog box, labeled "CEC/IMC Manager," displays the current channel configurations stored on the CEC/IMC Manager hard disk for the currently selected NIM. As the edit fields above this list box are modified for a selected channel, the changes will appear also in this list box for the selected channel.

View Current CEC/IMC Channel Configuration
The lower list box in the Site Channel Configuration dialog box, labeled "CEC/IMC," displays the current channel configurations stored at the CEC/IMC for the currently selected NIM. Information within this box updates only after **Send** is performed from the preceding Site Channel Configuration List dialog box.

CEC/IMC to Disk

Choose the **CEC/IMC to Disk** button to write the current CEC/IMC configuration data to the CEC/IMC Manager hard disk. This action will overwrite the current CEC/IMC Manager configuration for the selected interface module. This function is useful if the CEC/IMC Manager configuration database is lost for any reason. A difference between CEC/IMC and CEC/IMC Manager databases will be evident by comparing the CEC/IMC Manager and CEC/IMC list boxes in the Site Channel Configuration dialog box. Ensure that the CEC/IMC configuration is correct, then choose the **CEC/IMC to Disk** button to restore the CEC/IMC Manager configuration database (for the selected interface module).

Channel Selection
Select a channel (1 thru 32) for configuration from the CEC/IMC Manager channel list box, only one channel may be selected at a time. The selected channel and its configuration data will be displayed in the edit fields above the CEC/IMC Manager list box.

Input Signal Level (dBm)
This setting establishes the signal level in dBm (600-ohm impedance; 0 dBm = 1 milliwatt) applied to the selected channel's line input. Type the required value in the text box. The setting should be equal to the voice peak (test tone) level applied to the channel's line input. Voice peak levels are +10 dBm greater than average voice levels. Valid range is -25.0 dBm to 12.0 dBm, adjustable in 0.5 dBm increments. The program automatically rounds-off non-0.5 dBm fractional entries to the nearest 0.5 dBm point. Input Signal Level default = 0 dBm.

NOTE

If Automatic Level Control (ALC) is disabled for the selected channel, subtract 1.5 dBm from the required Input Signal Level setting. For example, if the required input signal level is -10 dBm, enter -11.5 dBm. ALC is disabled by setting the ALC text box to "NO."

LBI-38938 contains a line level adjustment overview section which contains general information and general recommendations for both input and output level settings.

Output Signal Level (dBm)
This setting establishes the signal level in dBm (600-ohm impedance; 0 dBm = 1 milliwatt) sent out by the selected channel's line output. The setting specifies the voice peak (test tone) level sent out by the channel. Valid range is -25.0 dBm to 13.0 dBm, in 0.5 dBm increments. Select the required value from the drop-down list box. Output Signal Level default = 0 dBm.

Bus/Slot Equipped
All utilized channels within an interface module must be allocated a time slot on the CEC/IMC TDM network. Allocate a time slot to the selected channel by setting Bus/Slot Equipped to "YES." A channel will not route audio correctly if is not allocated a time slot. Set all unused channels to "NO" (default setting).

Channel Equipped
This parameter is unique to NIMs, and must be enabled for each installed distributed multisite audio channel. Enter "YES" in the text box to enable those channels, enter "NO" for all unused channels.

ALC

CAUTION

DO NOT enable ALC for any channel if the respective Audio Board part number is 19D903302P1 (any revision).

Automatic Level Control (ALC) provides compensation for signal level variances in a channel line input signal. As required, enable ALC for the selected channel by entering "YES" in the ALC text box or disable it by entering "NO."

Save and Send NIM Audio Board Configurations

When channel configuration of the selected NIM is complete, the Site Channel Configuration dialog box changes must be sent to the CEC/IMC before the changes will take effect. This reprograms the NIM Controller Boards. However, it is important to save the new configuration prior to sending it to the CEC/IMC because a send will send the last configuration saved to disk; saving first ensures that the actual CEC/IMC channel configuration will be the same as the channel configuration stored on the CEC/IMC Manager hard disk. To save and send configurations, action is required first in the Site Channel Configuration dialog box and then in the Site Channel Configuration List dialog box.

Site Channel Configuration dialog box

Save

Choose the **Save** button to perform an immediate save of the currently selected site-type interface module's channel configuration. Other "sites" displayed in the list box located at the top of the dialog box are not saved. This channel configuration is saved on the CEC/IMC Manager hard disk drive. Any previous channel configuration for the "site," if present, is erased and replaced with the current channel configuration. If the CEC/IMC Manager is running remotely or as a part of the EDACS Network Manager, this configuration is saved on the CEC/IMC Manager server, typically local to the CEC/IMC; it is not saved at the remote location.

Save As...

Choose the **Save As…** button to allow the currently selected NIM channel configurations to be saved as a different NIM. It is provided to speed configurations when similar configurations are required. Upon choosing **Save As…** a small dialog box (See Figure 17) will appear which allows selection of a new NIM number. Select the desired NIM number from one of the choices in the drop-down list box, the choices listed are the selected NIMs in the Configured/Active Sites list box. Like **Save**, **Save As…** stores channel configuration on the CEC/IMC Manager server.

For example, if "Site 3" is the currently selected site-type interface module and "Site 12" requires similar configuration settings, this button may be used to save the "Site 3" configuration as "Site 12" (save to "12"). The new "site" may then be changed later, as required, by

selecting it via the selection list box, changing the configuration as required, and then choosing **Save**.

Close

Choose the **Close** button to exit this dialog box and return to the Site Channel Configuration List dialog box. If any changes have been made and not saved, you will be prompted (Write Changes to Disk?) to save and exit (**Yes**), exit without saving (**No**), or cancel the **Close** command and remain in the dialog box (**Cancel**).

Site Channel Configuration List dialog box

Send

Choose the **Send** button to send the site channel configuration data to the respective interface module. This procedure must be performed before the interface module will operate with the new configuration. Only configured and configured-and-active (C and C/A prefixes) configurations may be sent. All configuration data is sent to the MOM Controller Board; the Audio configuration is sent directly out from there to the respective interface module Controller Board. A "Send to Site Successful" message will be received to confirm that the data was received by the interface module Controller Board. Bus Slot configuration data is compared to the current configuration at the CEC/IMC Manager; if different, it is sent to the MOM Controller Board (if not, no further action is taken by the system) and when the MOM Controller Board receives this new data it will send an acknowledgment message back to the CEC/IMC Manager, which will then display the confirmation box: "Do you want to activate TDM Bus Slots? OK - will cause all CTRL boards to reset." Choose **OK** to activate TDM Bus Slots (resetting Controller Boards) with the new Bus Slot configuration data, choose **Cancel** to not activate TDM Bus Slots with the new Bus Slot configuration data (keeping the previous configuration) and return to the Site Channel Configuration List dialog box.

Close

Choose the **Close** button to exit the Site Channel Configuration List dialog box and return to the CEC/IMC Manager main window. Any "**" (unconfigured and unsaved) NIMs appearing in the Configured/Active Sites list box will be removed and returned to the Configurable Sites list box.

T1/E1 Equipped NIM Configuration

This section describes configuration for channels of T1/E1 Interface Card-equipped NIMs. Channel configurations are performed from the T1/E1 Digital Site Configuration dialog box, shown in Figure 18 on page 3-39, and from the T1/E1 Interface Card Auto-configuration dialog box, Figure 19 on page 3-42. As was the case with Audio Board-equipped NIMs, only those NIMs selected in the Site Channel Configuration List dialog box are available for channel configuration.

NOTE

Like the CEC/IMC Audio Board, each T1/E1 Interface Card within a CEC/IMC interface module must have a unique board address setting. This address is 1 - 8 (addresses 2 - 8 are currently not available).

NOTE

T1/E1 selection is performed at the CEC/IMC Manager on a CEC/IMC wide basis. Changing the Line Type will cause the complete T1/E1 database to be reset (lost). The Line Type shown as the "default" when the Audio Interface Type dialog box appears is how the system is configured and Line Type should not be changed.

The T1/E1 Interface Card provides a built-in T1 or E1 port for CEC/IMC interface modules. This port allows direct interfacing to T1/E1 microwave, fiber-optic, or leased lines facilities. Consequently, co-located T1/E1 multiplexing (mux) equipment at the CEC/IMC is eliminated when the T1/E1 Interface Card is employed. CEC/IMC Audio Boards are also eliminated within the particular interface module. Within each of these interface modules, one or more T1/E1 Interface Cards replace all Audio Boards. The T1/E1 Interface Card furnishes twenty-four full-duplex T1 channels in T1 mode and thirty-one full-duplex E1 channels in E1 mode. In addition to its T1/E1 port, the T1/E1 Interface Card also contains eight subrate ports which,

depending upon board configuration, can provide modem-less data links over spare T1/E1 channels to either internal or external devices. Some, all, or none of these ports can be utilized depending on board configuration. Five of the subrate ports support synchronous or asynchronous data links and the remaining three are synchronous-only ports.

T1/E1 Digital Site Configuration

Networked Systems Considerations

Any system nodes that are connected using T1/E1 Interfaces must remain frequency locked at all times. The T1/E1 Interface design allows for total network synchronization by offering the following CEC/IMC Configuration options. Each of these options are selectable by configuration of both the Clock Boards and the T1/E1 Interface Cards.

1. Master - Redundant Clock Circuits generated by the Clock Board in a FREE RUN mode. This allows any CEC/IMC to become the master source of Network timing. All nodes connected to this CEC/IMC will be in the slave mode. This mode is established by setting the Clock Board DIP switches to "Master" mode and all the T1/E1 Interface Cards' Slave Clock option to "NONE."

2. T1/E1 Slave - Redundant Clock Circuits generated by the Clock Board synchronized to 1 (or 2 with redundancy) T1/E1 Interface into the CEC/IMC. The CEC/IMC can be slaved to an external node that is connected through a T1/E1 link, and no additional timing source is needed. Timing from the T1/E1 line is passed to the Clock Board from the T1/E1 Interface Cards through a redundant set of synchronization clocks named Slave A and Slave B. Each T1/E1 Interface Card can provide Slave A, B or A&B. This mode is established by setting the Clock Board DIP switches to "Slave to 8kHz" and 1 T1/E1 Interface Card Slave Clock option set to "SLAVE A," with another set to "SLAVE B" for redundancy, or 1 T1/E1 Interface Card set to "SLAVE A&B" for no redundancy.

3. Slave to external 1.544 MHz - Redundant Clock Circuits generated by the Clock Board synchronized to 1 (or 2 with redundancy) external clock source. Any CEC/IMC can be synchronized to the timing output from a T1/E1 multiplexer, microwave radio, fiber network, etc. Connect the external timing source to both Clock Boards in the CEC/IMC for redundancy. This mode is established by setting the Clock Board DIP switches to "Slave to Ext. 1544 kHz" and all T1/E1 Interface Cards' Slave Clock option to "NONE."

4. Slave to external 2.048 MHz (E1 mode only) - Redundant Clock Circuits generated by the Clock Board synchronized to 1 (or 2 with redundancy) external clock source. Any CEC/IMC can be synchronized to the timing output from a T1/E1 multiplexer, microwave radio, fiber network, etc. Connect the external timing source to both Clock Boards in the CEC/IMC for redundancy. This mode is established by setting the Clock Board DIP switches to "Slave to 2048 kHz" and all T1/E1 Interface Cards' Slave Clock option to "NONE."

The following configuration guidelines must be followed for network synchronization:

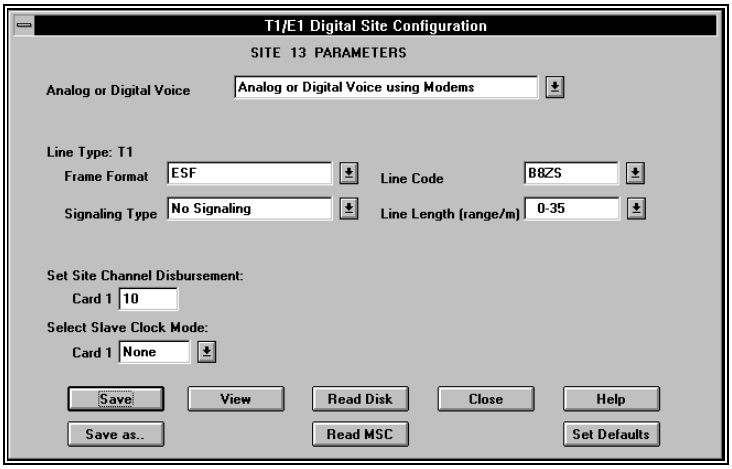
1. One node in the system must be the MASTER source of network timing. The CEC/IMC will support a primary and redundant (or alternate) MASTER sources of timing as indicated above.

2. A MASTER node can be defined as a site, a Jessica, a T1/E1 link, or a CEC/IMC.

3. All leased T1/E1 facilities from the telephone company are frequency locked by the phone company. If there are any phone company T1/E1 connections, one of the connections must be the MASTER source of timing. Any other phone company connections may be the redundant MASTER source of timing. Phone company T1/E1 connections include leased lines for sites/multinode and T1/E1 connections through an MD110 (Jessica).

4. Any nodes using analog interfaces (including analog connections from an MD110 to the phone company) may be disregarded for synchronization purposes.

5. If a node is not a MASTER timing node, it must be slaved to the T1/E1 link going towards the MASTER node.



Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

Analog or Digital Voice

In addition to T1 or E1 selection, T1/E1 Interface Card configuration includes selecting one of three primary board operating modes:

– **Analog/modem mode ("Analog or Digital Voice using Modems")**

In the analog/modem mode, the T1/E1 Interface Card transfers PCM-encoded signals between the CEC/IMC TDM network and the T1/E1 line. PCM-encoded signals transferred by this mode include analog (clear) voice, modem-encoded digital voice, and/or modem-encoded data signals. In this mode each site channel is assigned to a T1/E1 channel. In addition, this mode allows use of the T1/E1 Interface Card subrate ports if T1/E1 channels are available after site channel assignments.

Two CEC/IMC TDM bus slots coincide to one full duplex T1/E1 Channel. This is exactly analogous to a CEC/IMC Audio Board channel where two TDM bus slots coincide to one full duplex 4-wire 600-ohm audio channel provided by the Audio Board. The T1/E1 Interface Card extracts a signal from one bus slot and sends it out on a T1/E1 channel. Accordingly, signals received on this same T1/E1 channel are applied to a different CEC/IMC TDM bus slot.

- **Digital voice/data using subrate ports mode (currently not supported)**
- **Digital voice/data using T1/E1 mode (currently not supported)**

Line Type
This is a read-only field which indicates which type of line (T1 or E1) that the system is configured for.

Frame Format
Framing deals with how the digitized data stream is configured (formatted), a data stream with one framing format would not be recognized by a system with another frame format. The possible T1 formats are 4-Frame Multiframe (F4), 12-Frame Multiframe (F12, D3/4), Extended Superframe (ESF), and Remote Switch Mode (F72). The possible E1 formats are Doubleframe and CRC Multiframe. The format is determined by the service line used. Select from the available choices in the drop-down list box to match the line format.

Line Code
The line code indicates the method used to encode long strings of zeroes. The receiving end of a T1/E1 link would not be able to remain in sync if long strings of zeroes were transmitted. The possible T1 line codes are B8ZS and AMI w/ZCS. The E1 line code is HDB3. The line code also is determined by the service line utilized. Select from the available choices in the drop-down list box to match the line.

Signaling Type
This signaling is used by the T1/E1 Interface Card to transmit channel status information (busy or idle). T1 uses bits robbed from the channel data to convey this information. E1 uses a dedicated channel to send signaling information for all channels; therefore only 30 user channels are allowed. In a CEC/IMC system, signaling must be set for MIM site interfaces, and the T1/E1 muxes and base stations at the associated site location must be configured for E&M Signaling unless the site is all digital (no analog voice). Signaling should not be set for any other device types. The types of signaling are No Signaling (both T1 and E1), Robbed Bit for T1, and CAS-CC for E1. Select the signaling type from the drop-down list box.

Line Length
This is the distance between the CEC/IMC and the device at the other end of the T1 line, which could be a microwave transceiver, a mux in co-located site equipment, CSU, etc. Line effects change the signal

slightly, and the changes become more pronounced the further the signal travels down the line. The outgoing original signal is modified based upon line length so that the signal arriving at the destination closely resembles an ideal signal. Select the line length from the drop-down list box for T1 applications. E1 applications do not support selectable line lengths.

Set Site Channel Disbursement
The Set Site Channel Disbursement field sets the number of channels assigned to the indicated T1/E1 Interface Card. Enter the number of channels in the text box (1 - 24 for T1 or 1 - 31 for E1).

Select Slave Clock Mode
Selecting the Slave Clock Mode is part of a higher level system design, as mentioned earlier. Any system nodes that are connected using T1/E1 Interfaces must remain frequency locked at all times. The T1/E1 Interface design allows for total network synchronization through different CEC/IMC configuration options. A detailed discussion of the higher level system configuration is beyond the scope of this topic; however, for a more detailed discussion refer to *T1/E1 Interface Release Notes* (350A1909) and *CEC/IMC Digital Audio Switch Installation, Set-up, and Troubleshooting* (LBI-38938). Select the required clock mode from the drop-down list box.

View

Choose the **View** button to display the T1/E1 Interface Card Auto-configuration dialog box, which shows the T1/E1 channels and subrate port configurations.

Read Disk

Choose the **Read Disk** button to view the currently stored configuration on the CEC/IMC Manager hard disk. This normally should be the same as the actual configuration at the CEC/IMC.

Read MSC

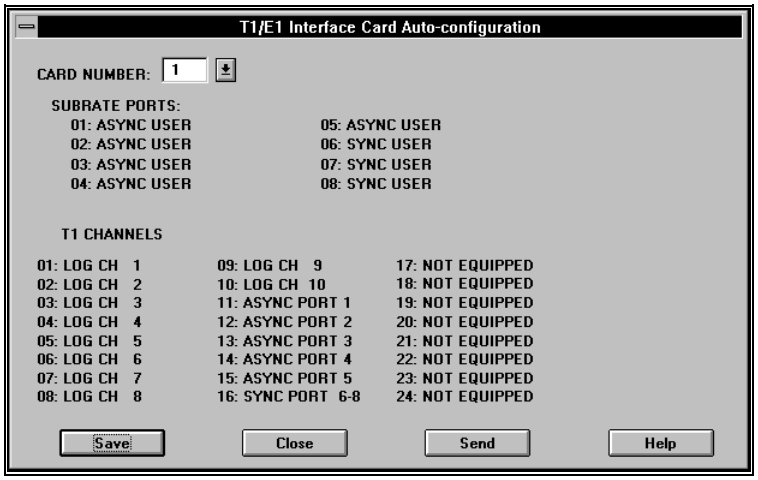
Choose the **Read MSC** button to view the actual configuration at the CEC/IMC (stored in the interface module's NOVRAM). This normally should be the same as the configuration stored on the CEC/IMC Manager hard disk. If the CEC/IMC Manager hard disk data was cleared or reset to undesired values, **Read MSC** followed by **Save** will restore the CEC/IMC Manager hard disk configuration.

Set Defaults

Choose the **Set Defaults** button to select the pre-programmed default values from the CEC/IMC Manager hard disk. These values will replace any currently displayed values; however, these "new" values must be saved and sent before they will become the new configuration.

T1/E1 Interface Card Auto-configuration

Subrate ports and channel assignments are auto-configured by the CEC/IMC Manager according to the number of free T1/E1 channels. In Figure 19, the T1/E1 Interface Card Auto-configuration dialog box is shown. Although there are no user configurable fields in this dialog box, the assignment of subrate ports and T1/E1 channels can be viewed on a per card basis in this dialog box. Select the card to view from the drop-down list box in the top left corner.



Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

T1/E1 Channel Assignment

T1/E1 logical channels are assigned starting with channel 1, these are the channels used to transmit voice, data, and image signals from one system node to another. E1 channel 16 is used for signaling if signaling is enabled. (See "Signaling Type" under T1/E1 Digital Site Configuration above.) Subrate ports for user data are assigned channels adjacent/after logical channels according to Table 2 on page 3-43.

Asynchronous (async) ports, up to 5, are assigned first and then synchronous (sync) ports are assigned.

Save And Send NIM T1/E1 Configurations

Any T1/E1 Digital Site Configuration dialog box or T1/E1 Interface Card Auto-configuration dialog box changes must be sent before the changes will come into effect at the CEC/IMC. This reprograms the NIM Controller Boards and T1/E1 Interface Cards. The new configurations must be saved before sent to the CEC/IMC, if sending is attempted before saving a "Site data must be saved to disk prior to send" message box will appear. Save and send may be performed either from the T1/E1 Interface Card Auto-configuration dialog box only, or from the Site Channel Configuration List dialog box, similar to Audio Board save and send.

T1/E1 Interface Card Auto-configuration dialog box

Save

Choose the **Save** button to perform an immediate save of the currently selected site-type interface module's channel configuration. The channel configuration is saved on the CEC/IMC Manager's hard disk drive. Any previous channel configuration for the "site," if present, is erased and replaced with the current channel configuration. If the CEC/IMC Manager is running remotely or as a part of the EDACS Network Manager, this configuration is saved on the CEC/IMC Manager server, typically local to the CEC/IMC; it is not saved at the remote location.

Send

Choose the **Send** button to send the T1/E1 site channel configuration data to the respective interface module. This procedure must be performed before the interface module will operate with the new configuration. Only configured and configured-and-active (C and C/A prefixes) configurations may be sent. All configuration data is sent to the MOM Controller Board; the T1/E1 configuration is sent directly out from there to the respective interface module Controller Board. A "Send to Site Successful" message will be received to confirm that the data was received by the interface module Controller Board. Bus Slot configuration data is based on the channel assignment in the Set Site Channel Disbursement field (one bus slot per channel assigned) and is compared to the current configuration at the CEC/IMC Manager; if different, it is sent to the MOM Controller Board (if not, no further

action is taken by the system) and when the MOM Controller Board receives this new data it will send an acknowledgment message back to the CEC/IMC Manager, which will then display the confirmation box: "Do you want to activate TDM Bus Slots? OK - will cause all CTRL boards to reset." Choose **OK** to activate TDM Bus Slots (resetting Controller Boards) with the new Bus Slot configuration data, choose **Cancel** to not activate TDM Bus Slots with the new Bus Slot configuration data (keeping the previous configuration) and return to the T1/E1 Interface Card Auto-configuration dialog box.

T1/E1 Digital Site Configuration dialog box

Save

Choose the **Save** button to perform an immediate save of the currently selected site-type interface module's channel configuration. This channel configuration is saved on the CEC/IMC Manager's hard disk drive. Any previous channel configuration for the "site," if present, is erased and replaced with the current channel configuration. If the CEC/IMC Manager is running remotely or as a part of the EDACS Network Manager, this configuration is saved on the CEC/IMC Manager server, typically local to the CEC/IMC; it is not saved at the remote location.

Save As...

Choose the **Save As…** button to allow the currently selected site-type interface module channel configurations to be saved as a different site-type interface module. It is provided to speed configurations when similar NIM configurations are required. Upon choosing **Save As…** a small dialog box, similar to Figure 17 on page 3-34, will appear which allows selection of a new NIM number. Select the desired NIM number from one of the choices in the displayed list, the choices displayed are the selected NIMs in the Configured/Active Sites list box. Like **Save**, **Save As…** stores channel configuration on the CEC/IMC Manager server.

Close

Choose the **Close** button to exit the T1/E1 Digital Site Configuration dialog box. If any changes have been made and not saved, a prompt will appear to warn of the unsaved changes and the user will be given the opportunity to save and exit (**Save**)or exit without saving the changes (**Cancel**).

Site Channel Configuration List dialog box

Send

Choose the **Send** button to send the T1/E1 site channel configuration data to the respective interface module. This procedure must be performed before the interface module will operate with the new configuration. Only configured and configured-and-active (C and C/A prefixes) configurations may be sent. All configuration data is sent to the MOM Controller Board; the T1/E1 configuration is sent directly out from there to the respective interface module Controller Board. A "Send to Site Successful" message will be received to confirm that the data was received by the interface module Controller Board. Bus Slot configuration data is based on the channel assignment in the Set Site Channel Disbursement field (one bus slot per channel assigned) and is compared to the current configuration at the CEC/IMC Manager; if different, it is sent to the MOM Controller Board (if not, no further action is taken by the system) and when the MOM Controller Board receives this new data it will send an acknowledgment message back to the CEC/IMC Manager, which will then display the confirmation box: "Do you want to activate TDM Bus Slots? OK - will cause all CTRL boards to reset." Choose **OK** to activate TDM Bus Slots (resetting Controller Boards) with the new Bus Slot configuration data, choose **Cancel** to not activate TDM Bus Slots with the new Bus Slot configuration data (keeping the previous configuration) and return to the Site Channel Configuration List dialog box.

Close

Choose the **Close** button to exit the Site Channel Configuration List dialog box and return to the CEC/IMC Manager main window. Any "**" (unconfigured and unsaved) NIMs appearing in the Configured/Active Sites list box will be removed and returned to the Configurable Sites list box.

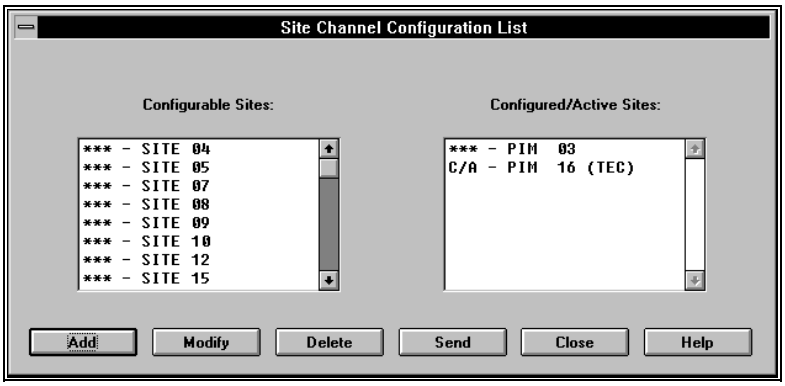
3.8.3 PIM Channel Configuration

The interface between the CEC/IMC and a Jessica PBX Gateway system, known simply as Jessica, is provided by the **P**rivate Branch eXchange (PBX) **I**nterface **M**odule (**PIM**). A PIM can provide up to 32 channels for Jessica PBX systems. The PIM consists of a Controller Board and up to eight Audio Boards or T1/E1 Interface Cards.

PIM "Site" Selection

Prior to actual channel configuration, the interface module to be configured must be selected. From the CEC/IMC Manager menu bar select Configure System / CEC/IMC Configuration / PIM to display the Site Channel Configuration List dialog box for that module.

Each Site Channel Configuration List dialog box displays the configurable PIMs and configured/active PIMs. A configured and active PIM represents an operating link between a Jessica PBX Gateway system and the PIM Controller Board.



Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

Configurable Sites:
The Configurable Sites list box displays all inactive unconfigured site-type interface modules. If a PIM appears in this box, no channel configuration exists at the CEC/IMC Manager and no active Controller Board control data link exists at the CEC/IMC for the corresponding site assignment number. Any number of these available PIMs may be selected at one time to be assigned to the Configured/Active Sites list box for configuration.

Configured/Active Sites:
The Configured/Active Sites list box displays PIMs which have been added but not yet channel-configured, PIMs which have had previous channel configurations performed, and PIMs which have been previously channel-configured and have an active Controller Board control data link. Before a PIM can be channel-configured, it must be listed in the Configured/Active Sites list box. Any number of these

available PIMs may be selected at one time for modification in the Site Channel Configuration dialog box. All selected PIMs in this list will also be included in the "**Save As…**" dialog box that is accessed from the Site Channel Configuration dialog box or the T1/E1 Digital Site Configuration dialog box. If necessary, refer to Configured/Active Sites Prefix Definitions, Table 1, on page 3-25 for an explanation of the prefixes.

Add

Choose the **Add** button to move a selected PIM from the Configurable Sites list box and "add" it to the Configured/Active Sites list box where it can be configured. If upon adding a PIM, a configuration data file exists on the CEC/IMC Manager's hard disk drive from a previous add and delete, the site will be added to the Configured/Active Sites list box with its configuration data file (with a ** prefix). This previous configuration may be modified, re-saved and sent as needed.

Modify

Choose the **Modify** button to display the Audio Interface Type dialog box, select either Audio Board or T1/E1 Interface as required by clicking the appropriate option button. Selecting Audio Board will activate the Site Channel Configuration dialog box, selecting T1/E1 Interface will activate the T1/E1 Digital Site Configuration dialog box. These options are discussed in detail in subsequent sections.

Delete

Choose the **Delete** button to remove ("delete") a selected configured or unconfigured site from the Configured/Active Sites list box to the Configurable Sites list box. Configured-and-active sites cannot be "deleted." This delete function does not remove "site" channel configuration files from the CEC/IMC Manager's hard disk drive. Therefore, if the deleted "site" is subsequently added back to the Configured/Active Sites list box using the **Add** button, the previous channel configuration is not lost (this configuration data must be re-saved in the Site Channel Configuration dialog box before it can be resent to the CEC/IMC).

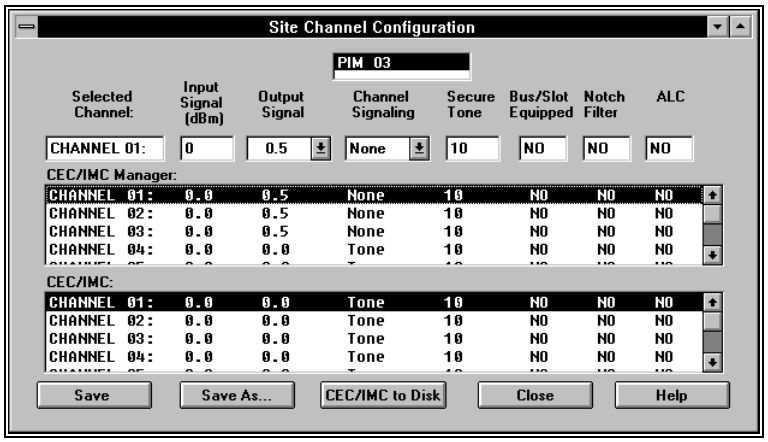
Close

Choose the **Close** button to exit the Site Channel Configuration List dialog box and return to the CEC/IMC Manager main window. Any "**" (unconfigured and unsaved) PIMs appearing in the

Configured/Active Sites list box will be removed and returned to the Configurable Sites list box.

Audio Board-Equipped PIM Configuration

This section describes configurations for channels within Audio Board-equipped site-type interface modules. All channel parameters are configured from the Site Channel Configuration dialog box. Only those PIMs which were selected in the Site Channel Configuration List dialog box are available for channel configuration. Select the desired PIMs to configure from the Configured/Active Sites list, or add the desired PIMs from the Configurable Sites list, if not already listed, as described earlier. Choose **Modify** to display the Audio Interface Type dialog box, select the Audio Board option button, then choose **OK** to display the Site Channel Configuration dialog box. The selected PIMs are displayed in a list box at the top center of the dialog box.



Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

View Current CEC/IMC Manager Channel Configuration

The upper list box in the Site Channel Configuration dialog box, labeled "CEC/IMC Manager," displays the current channel configurations stored on the CEC/IMC Manager hard disk for the currently selected PIM. As the edit fields above this list box are modified for a selected channel, the changes will appear also in this list box for the selected channel.

View Current CEC/IMC Channel Configuration
The lower list box in the Site Channel Configuration dialog box, labeled "CEC/IMC," displays the current channel configurations stored at the CEC/IMC for the currently selected site-type interface module. Information within this box updates only after **Send** is performed from the preceding Site Channel Configuration List dialog box.

CEC/IMC to Disk

Choose the **CEC/IMC to Disk** button to write the current CEC/IMC configuration data to the CEC/IMC Manager hard disk. This action will overwrite the current CEC/IMC Manager configuration for the selected interface module. This function is useful if the CEC/IMC Manager configuration database is lost for any reason. A difference between CEC/IMC and CEC/IMC Manager databases will be evident by comparing the CEC/IMC Manager and CEC/IMC list boxes in the Site Channel Configuration dialog box. Ensure that the CEC/IMC configuration is correct, then choose the **CEC/IMC to Disk** button to restore the CEC/IMC Manager configuration database for the selected interface module.

Channel Selection
Select a channel (1 thru 32) for configuration from the CEC/IMC Manager channel list box, only one channel may be selected at a time. The selected channel and its configuration data will be displayed in the edit fields above the CEC/IMC Manager list box.

Input Signal Level (dBm)
This setting establishes the signal level in dBm (600-ohm impedance; 0 dBm = 1 milliwatt) applied to the selected channel's line input. Enter (type) the required value in the text box. The setting should be equal to the voice peak (test tone) level applied to the channel's line input. Voice peak levels are +10 dBm greater than average voice levels. Valid range is -25.0 dBm to 12.0 dBm, adjustable in 0.5 dBm increments. The program automatically rounds-off non-0.5 dBm fractional entries to the nearest 0.5 dBm. Input Signal Level default = 0 dBm.

NOTE

If Automatic Level Control (ALC) is disabled for the selected channel, subtract 1.5 dBm from the required Input Signal Level setting. For example, if the required input signal level is -10 dBm, enter -11.5 dBm. ALC is disabled by setting the ALC text box to "NO."

LBI-38938 contains a line level adjustment overview section which contains general information and general recommendations for both input and output level settings. For PIMs, refer to system manual *EDACS Jessica PBX Gateway*, LBI-39000, for PIM input and output level setting information.

Output Signal Level (dBm)
This setting establishes the signal level in dBm (600-ohm impedance; 0 dBm = 1 milliwatt) sent out by the selected channel's line output. The setting specifies the voice peak (test tone) level sent out by the channel. The valid range is -25.0 dBm to 13.0 dBm in 0.5 dBm increments. Select the required value from the drop-down list box. Output Signal Level default = 0 dBm.

Channel Signaling
For a PIM Channel Signaling should always be set to "NONE."

Secure Tone
The Secure Tone setting is not utilized for PIM site-type interface modules as Channel Signaling should always be set to "NONE."

Bus/Slot Equipped
All utilized channels within an interface module must be allocated a time slot on the CEC/IMC TDM network. Allocate a time slot to the selected channel by setting Bus/Slot Equipped to "YES." A channel will not route audio correctly if is not allocated a time slot. Set all unused channels to "NO," (the default setting).

NOTE

In earlier CEC/IMC firmware/software releases, slot allocations could only be made contiguously starting with channel one (1). In some systems this produced slot allocation inefficiencies—some slots had to be allocated but were never used. CEC/IMC software/firmware release 5.0 (and later) provides non-contiguous slot allocations. In this release, only those slots actually required need be allocate. For example, channels 1 and 4 can be allocated slots without allocating slots to channels 2 and 3.

Notch Filter

Do not enable the notch filter on any utilized channel for a PIM, therefore set Notch Filter to "NO" (disabled).

ALC

CAUTION

DO NOT enable ALC for any channel if the respective Audio Board part number is 19D903302P1 (any revision).

Automatic Level Control (ALC) provides compensation for signal level variances in a channel line input signal. As required, enable ALC for the selected channel by entering "YES" in the ALC text box or disable it by entering "NO."

Save and Send PIM Audio Board Configurations

When channel configuration of the selected PIM is complete, the Site Channel Configuration dialog box changes must be sent to the CEC/IMC before the changes will take effect. This reprograms the PIM Controller Boards. However, it is important to save the new configuration prior to sending it to the CEC/IMC because a send will send the last configuration that was saved to disk; saving first ensures that the actual CEC/IMC channel configuration will be the same as the channel configuration stored on the CEC/IMC Manager hard disk. To save and send configurations, action is required first in the Site Channel Configuration dialog box and then in the Site Channel Configuration List dialog box.

Site Channel Configuration dialog box

Save

Choose the **Save** button to perform an immediate save of the currently selected PIM channel configuration. Other PIMs displayed in the list box located at the top of the dialog box are not saved. This channel configuration is saved on the CEC/IMC Manager's hard disk drive. Any previous channel configuration for the PIM, if present, is erased and replaced with the current channel configuration. If the CEC/IMC Manager is running remotely or as a part of the EDACS Network Manager, this configuration is saved on the CEC/IMC Manager server, typically local to the CEC/IMC; it is not saved at the remote location.

Save As...

Choose the **Save As…** button to allow the currently selected PIM channel configurations to be saved as a different PIM. It is provided to speed configurations when similar configurations are required. Upon choosing **Save As…** a small dialog box (see Figure 17 on page 3-34) will appear which allows selection of a new PIM number. Select the desired PIM number from one of the choices in the drop-down list box, the choices listed are the selected PIMs in the Configured/Active Sites list box. Like **Save**, **Save As…** stores channel configuration on the CEC/IMC Manager local to the CEC/IMC.

For example, if "Site 8" is the currently selected site-type interface module and "Site 12" requires similar configuration settings, this button may be used to save "Site 8" configuration as "Site 12" (save to "12"). The new "site" may then be changed later, as required, by selecting it from the selection list box, changing the configuration as required, and then choosing **Save**.

Close

Choose the **Close** button to exit the Site Channel Configuration dialog box and return to the Site Channel Configuration List dialog box. If any changes have been made and not saved, you will be prompted (Write Changes to Disk?) to save and exit (**Yes**), exit without saving (**No**), or cancel the **Close** command and remain in the dialog box (**Cancel**).

Site Channel Configuration List dialog box

Send

Choose the **Send** button to send the site channel configuration data to the respective interface module. This procedure must be performed before the interface module will operate with the new configuration. Only configured and configured-and-active (C and C/A prefixes) configurations may be sent. All configuration data is sent to the MOM Controller Board; the Audio configuration is sent directly out from there to the respective interface module Controller Board. A "Send to Site Successful" message will be received to confirm that the data was received by the interface module Controller Board. Bus Slot configuration data is compared to the current configuration at the CEC/IMC Manager; if different, it is sent to the MOM Controller Board (if not, no further action is taken by the system) and when the MOM Controller Board receives this new data it will send an acknowledgment message back to the CEC/IMC Manager, which will then display the confirmation box: "Do you want to activate TDM Bus Slots? OK - will cause all CTRL boards to reset." Choose **OK** to activate TDM Bus Slots (resetting Controller Boards) with the new Bus Slot configuration data, choose **Cancel** to not activate TDM Bus Slots with the new Bus Slot configuration data (keeping the previous configuration) and return to the Site Channel Configuration List dialog box.

Close

Choose the **Close** button to exit the Site Channel Configuration List dialog box and return to the CEC/IMC Manager main window. Any "**" (unconfigured and unsaved) PIMs appearing in the Configured/Active Sites list box will be removed and returned to the Configurable Sites list box.

T1/E1 Interface Card-Equipped PIM Configuration

This section describes configuration for channels of T1/E1 Interface Card-equipped PIMs (currently only MIMs, NIMs, and PIMs are so equipped). Channel configurations are performed from the T1/E1 Digital Site Configuration dialog box (see Figure 18 on page 3-39) and from the T1/E1 Interface Card Auto-configuration dialog box (see Figure 19 on page 3-42). As was the case with Audio Board-equipped site-type interface modules, only those "sites" which were selected in the Site Channel Configuration List dialog box are available for channel configuration.

NOTE

Like the CEC/IMC Audio Board, each T1/E1 Interface Card within a CEC/IMC interface module must have a unique board address setting. This address is 1 - 8 (addresses 2 - 8 are currently not available).

NOTE

T1/E1 selection is performed at the CEC/IMC Manager on a CEC/IMC wide basis. Changing the Line Type will cause the complete T1/E1 database to be reset (lost). The Line Type shown as the "default" when the Audio Interface Type dialog box appears is how the system is configured and Line Type should not be changed.

The T1/E1 Interface Card provides a built-in T1 or E1 port for CEC/IMC interface modules. This port allows direct interfacing to T1/E1 microwave, fiber-optic, or leased lines facilities. Consequently, co-located T1/E1 multiplexing (mux) equipment at the CEC/IMC is eliminated when the T1/E1 Interface Card is employed. CEC/IMC Audio Boards are also eliminated within the particular interface module. Within each of these interface modules, one or more T1/E1 Interface Cards replace all Audio Boards. The T1/E1 Interface Card furnishes twenty-four full-duplex T1 channels in T1 mode and thirty-one full-duplex E1 channels in E1 mode. In addition to its T1/E1 port, the T1/E1 Interface Card also contains eight subrate ports which, depending upon board configuration, can provide modem-less data links over spare T1/E1 channels to either internal or external devices. Some, all, or none of these ports can be utilized depending on board configuration. Five of the subrate ports support synchronous or asynchronous data links and the remaining three are synchronous-only ports.

T1/E1 Digital Site Configuration

Networked Systems Considerations

Any system nodes that are connected using T1/E1 Interfaces must remain frequency locked at all times. The T1/E1 Interface design allows for total network synchronization by offering the following CEC/IMC Configuration options. Each of these options are selectable by configuration of both the Clock Boards and the T1/E1 Interface Cards.

1. Master - Redundant Clock Circuits generated by the Clock Board in a FREE RUN mode. This allows any CEC/IMC to become the master source of Network timing. All nodes connected to this CEC/IMC will be in the slave mode. This mode is established by setting the Clock Board DIP switches to "Master" mode and all the T1/E1 Interface Cards' Slave Clock option to "NONE."

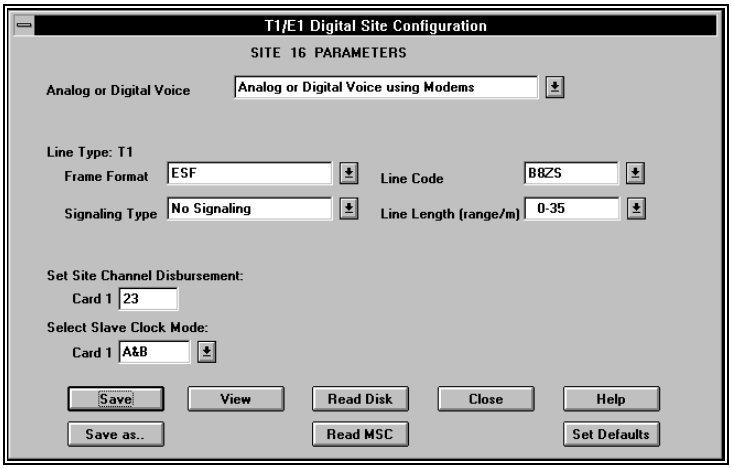
2. T1/E1 Slave - Redundant Clock Circuits generated by the Clock Board synchronized to 1 (or 2 with redundancy) T1/E1 Interface into the CEC/IMC. The CEC/IMC can be slaved to an external node that is connected through a T1/E1 link, and no additional timing source is needed. Timing from the T1/E1 line is passed to the Clock Board from the T1/E1 Interface Cards through a redundant set of synchronization clocks named Slave A and Slave B. Each T1/E1 Interface Card can provide Slave A, B or A&B. This mode is established by setting the Clock Board DIP switches to "Slave to 8kHz" and 1 T1/E1 Interface Card Slave Clock option set to "SLAVE A," with another set to "SLAVE B" for redundancy, or 1 T1/E1 Interface Card set to "SLAVE A&B" for no redundancy.

3. Slave to external 1.544 MHz - Redundant Clock Circuits generated by the Clock Board synchronized to 1 (or 2 with redundancy) external clock source. Any CEC/IMC can be synchronized to the timing output from a T1/E1 multiplexer, microwave radio, fiber network, etc. Connect the external timing source to both Clock Boards in the CEC/IMC for redundancy. This mode is established by setting the Clock Board DIP switches to "Slave to Ext. 1544 kHz" and all T1/E1 Interface Cards' Slave Clock option to "NONE."

4. Slave to external 2.048 MHz (E1 mode only) - Redundant Clock Circuits generated by the Clock Board synchronized to 1 (or 2 with redundancy) external clock source. Any CEC/IMC can be synchronized to the timing output from a T1/E1 multiplexer, microwave radio, fiber network, etc. Connect the external timing source to both Clock Boards in the CEC/IMC for redundancy. This mode is established by setting the Clock Board DIP switches to "Slave to 2048 kHz" and all T1/E1 Interface Cards' Slave Clock option to "NONE."

The following configuration guidelines must be followed for network synchronization:

1. One node in the system must be the MASTER source of network timing. The CEC/IMC will support a primary and redundant (or alternate) MASTER sources of timing as indicated above.
2. A MASTER node can be defined as a site, a Jessica, a T1/E1 link, or a CEC/IMC.
3. All leased T1/E1 facilities from the telephone company are frequency locked by the phone company. If there are any phone company T1/E1 connections, one of the connections must be the MASTER source of timing. Any other phone company connections may be the redundant MASTER source of timing. Phone company T1/E1 connections include leased lines for sites/multinode and T1/E1 connections through an MD110 (Jessica).
4. Any nodes using analog interfaces (including analog connections from an MD110 to the phone company) may be disregarded for synchronization purposes.
5. If a node is not a MASTER timing node, it must be slaved to the T1/E1 link going towards the MASTER node.



Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

Analog or Digital Voice

In addition to T1 or E1 selection, T1/E1 Interface Card configuration includes selecting one of three primary board operating modes:

– **Analog/modem mode ("Analog or Digital Voice using Modems")**

In the analog/modem mode, the T1/E1 Interface Card transfers PCM-encoded signals between the CEC/IMC TDM network and the T1/E1 line. PCM-encoded signals transferred by this mode include analog (clear) voice, modem-encoded digital voice, and/or modem-encoded data signals. In this mode each site channel is assigned to a T1/E1 channel. In addition, this mode allows use of the T1/E1 Interface Card subrate ports if T1/E1 channels are available after site channel assignments.

Two CEC/IMC TDM bus slots coincide to one full duplex T1/E1 Channel. This is exactly analogous to a CEC/IMC Audio Board channel where two TDM bus slots coincide to one full duplex 4-wire 600-ohm audio channel provided by the Audio Board. The T1/E1 Interface Card extracts a signal from one bus slot and sends it out on a T1/E1 channel. Accordingly, signals received on this same T1/E1 channel are applied to a different CEC/IMC TDM bus slot.

- **Digital voice/data using subrate ports mode (currently not supported)**
- **Digital voice/data using T1/E1 mode (currently not supported)**

Line Type
This is a read-only field which indicates which type of line (T1 or E1) that the system is configured for.

Frame Format
Framing deals with how the digitized data stream is configured (formatted), a data stream with one framing format would not be recognized by a system with another frame format. The possible T1 formats are 4-Frame Multiframe (F4), 12-Frame Multiframe (F12, D3/4), Extended Superframe (ESF), and Remote Switch Mode (F72). The possible E1 formats are Doubleframe and CRC Multiframe. The format is determined by the service line used. Select from the available choices in the drop-down list box to match the line format.

Line Code
The line code indicates the method used to encode long strings of zeroes. The receiving end of a T1/E1 link would not be able to remain in sync if long strings of zeroes were transmitted. The possible T1 line codes are B8ZS and AMI w/ZCS. The E1 line code is HDB3. The line code also is determined by the service line utilized. Select from the available choices in the drop-down list box to match the line.

Signaling Type
This signaling is used by the T1/E1 Interface Card to transmit channel status information (busy or idle). T1 uses bits robbed from the channel data to convey this information. E1 uses a dedicated channel to send signaling information for all channels; therefore only 30 user channels are allowed. In a CEC/IMC system, signaling must be set for MIM site interfaces, and the T1/E1 muxes and base stations at the associated site location must be configured for E&M Signaling unless the site is all digital (no analog voice). Signaling should not be set for any other device types. The types of signaling are No Signaling (both T1 and E1), CAS-BR for T1, and CAS-CC for E1. Select the signaling type from the drop-down list box.

Line Length
This is the distance between the CEC/IMC and the device at the other end of the T1 line, which could be a microwave transceiver, a mux in co-located site equipment, CSU, etc. Line effects change the signal

slightly, and the changes become more pronounced the further the signal travels down the line. The outgoing original signal is modified based upon line length so that the signal arriving at the destination closely resembles an ideal signal. Select the line length from the drop-down list box for T1 applications. E1 applications do not support selectable line lengths.

Set Site Channel Disbursement
The Set Site Channel Disbursement field sets the number of channels assigned to the indicated T1/E1 Interface Card. Enter the number of channels in the text box (1 - 24 for T1 or 1 - 31 for E1).

Select Slave Clock Mode
Selecting the Slave Clock Mode is part of a higher level system design, as mentioned earlier. Any system nodes that are connected using T1/E1 Interfaces must remain frequency locked at all times. The T1/E1 Interface design allows for total network synchronization through different CEC/IMC configuration options. A detailed discussion of the higher level system configuration is beyond the scope of this topic; however, for a more detailed discussion refer to *T1/E1 Interface Release Notes* (350A1909) and *CEC/IMC Digital Audio Switch Installation, Set-up, and Troubleshooting* (LBI-38938). Select the required clock mode from the drop-down list box.

Choose the **View** button to display the T1/E1 Interface Card Auto-configuration dialog box, which shows the T1/E1 channels and subrate port configurations.

Choose the **Read Disk** button to view the currently stored configuration on the CEC/IMC Manager hard disk. This normally should be the same as the actual configuration at the CEC/IMC.

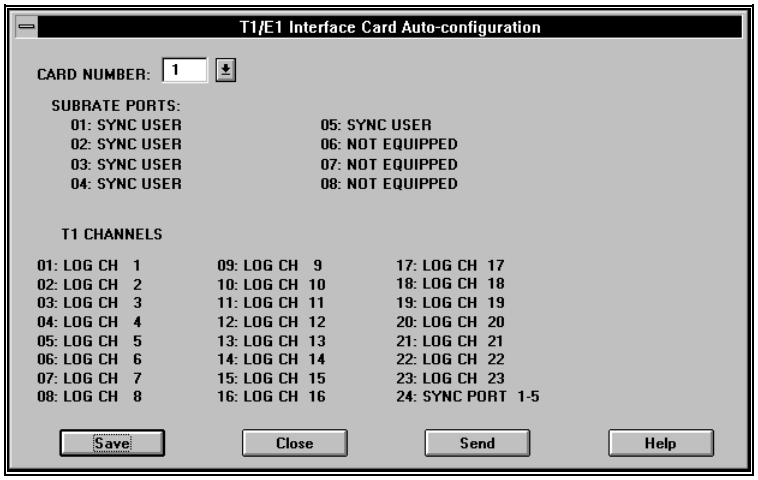
Choose the **Read MSC** button to view the actual configuration at the CEC/IMC (stored in the interface module's NOVRAM). This normally should be the same as the configuration stored on the CEC/IMC Manager hard disk. If the CEC/IMC Manager hard disk data was cleared or reset to undesired values, **Read MSC** followed by **Save** will restore the CEC/IMC Manager hard disk configuration.

Set Defaults

Choose the **Set Defaults** button to select the pre-programmed default values from the CEC/IMC Manager hard disk. These values will replace any currently displayed values; however, these "new" values must be saved and sent before they will become the new configuration.

T1/E1 Interface Card Auto-configuration

Subrate ports and channel assignments are auto-configured by the CEC/IMC Manager according to the number of free T1/E1 channels. In Figure 19, the T1/E1 Interface Card Auto-configuration dialog box is shown. Although there are no user configurable fields in this dialog box, the assignment of subrate ports and T1/E1 channels can be viewed on a per card basis in this dialog box. Select the card to view from the drop-down list box in the top left corner.



Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

T1/E1 Channel Assignment

T1/E1 logical channels are assigned starting with channel 1, these are the channels used to transmit voice, data, and image signals from one system node to another. E1 channel 16 is used for signaling if signaling is enabled. (See "Signaling Type" under T1/E1 Digital Site Configuration above.) Subrate ports for user data are assigned channels adjacent/after logical channels according to Table 2. Asynchronous

(async) ports, up to 5, are assigned first and then synchronous (sync) ports are assigned.

Save And Send PIM T1/E1 Configurations

Any T1/E1 Digital Site Configuration dialog box or T1/E1 Interface Card Auto-configuration dialog box changes must be sent before the changes will come into effect at the CEC/IMC. This reprograms the PIM Controller Boards and T1/E1 Interface Cards. The new configurations must be saved before sent to the CEC/IMC, if sending is attempted before saving a "Site data must be saved to disk prior to send" message box will appear. Save and send may be performed either from the T1/E1 Interface Card Auto-configuration dialog box only, or from the Site Channel Configuration List dialog box, similar to Audio Board save and send.

T1/E1 Interface Card Auto-configuration dialog box

Save

Choose the **Save** button to perform an immediate save of the currently selected site-type interface module's channel configuration. The channel configuration is saved on the CEC/IMC Manager's hard disk drive. Any previous channel configuration for the "site," if present, is erased and replaced with the current channel configuration. If the CEC/IMC Manager is running remotely or as a part of the EDACS Network Manager, this configuration is saved on the CEC/IMC Manager server, typically local to the CEC/IMC; it is not saved at the remote location.

Send

Choose the **Send** button to send the T1/E1 site channel configuration data to the respective interface module. This procedure must be performed before the interface module will operate with the new configuration. Only configured and configured-and-active (C and C/A prefixes) configurations may be sent. All configuration data is sent to the MOM Controller Board; the T1/E1 configuration is sent directly out from there to the respective interface module Controller Board. A "Send to Site Successful" message will be received to confirm that the data was received by the interface module Controller Board. Bus Slot configuration data is based on the channel assignment in the Set Site Channel Disbursement field (one bus slot per channel assigned) and is compared to the current configuration at the CEC/IMC Manager; if different, it is sent to the MOM Controller Board (if not, no further

action is taken by the system) and when the MOM Controller Board receives this new data it will send an acknowledgment message back to the CEC/IMC Manager, which will then display the confirmation box: "Do you want to activate TDM Bus Slots? OK - will cause all CTRL boards to reset." Choose **OK** to activate TDM Bus Slots (resetting Controller Boards) with the new Bus Slot configuration data, choose **Cancel** to not activate TDM Bus Slots with the new Bus Slot configuration data (keeping the previous configuration) and return to the T1/E1 Interface Card Auto-configuration dialog box.

T1/E1 Digital Site Configuration dialog box

Save

Choose the **Save** button to perform an immediate save of the currently selected site-type interface module's channel configuration. This channel configuration is saved on the CEC/IMC Manager's hard disk drive. Any previous channel configuration for the "site," if present, is erased and replaced with the current channel configuration. If the CEC/IMC Manager is running remotely or as a part of the EDACS Network Manager, this configuration is saved on the CEC/IMC Manager server, typically local to the CEC/IMC; it is not saved at the remote location.

Save As...

Choose the **Save As…** button to allow the currently selected site-type interface module channel configurations to be saved as a different site-type interface module. It is provided to speed configurations when similar PIM configurations are required. Upon choosing **Save As…** a small dialog box, similar to Figure 17 on page 3-34, will appear which allows selection of a new PIM number. Select the desired PIM number from one of the choices in the displayed list, the choices displayed are the selected PIMs in the Configured/Active Sites list box. Like **Save**, **Save As…** stores channel configuration on the CEC/IMC Manager server.

Close

Choose the **Close** button to exit the T1/E1 Digital Site Configuration dialog box. If any changes have been made and not saved, a prompt will appear to warn of the unsaved changes and the user will be given the opportunity to save and exit (**Save**)or exit without saving the changes (**Cancel**).

Site Channel Configuration List dialog box

Send

Choose the **Send** button to send the T1/E1 site channel configuration data to the respective interface module. This procedure must be performed before the interface module will operate with the new configuration. Only configured and configured-and-active (C and C/A prefixes) configurations may be sent. All configuration data is sent to the MOM Controller Board; the T1/E1 configuration is sent directly out from there to the respective interface module Controller Board. A "Send to Site Successful" message will be received to confirm that the data was received by the interface module Controller Board. Bus Slot configuration data is based on the channel assignment in the Set Site Channel Disbursement field (one bus slot per channel assigned) and is compared to the current configuration at the CEC/IMC Manager; if different, it is sent to the MOM Controller Board (if not, no further action is taken by the system) and when the MOM Controller Board receives this new data it will send an acknowledgment message back to the CEC/IMC Manager, which will then display the confirmation box: "Do you want to activate TDM Bus Slots? OK - will cause all CTRL boards to reset." Choose **OK** to activate TDM Bus Slots (resetting Controller Boards) with the new Bus Slot configuration data, choose **Cancel** to not activate TDM Bus Slots with the new Bus Slot configuration data (keeping the previous configuration) and return to the Site Channel Configuration List dialog box.

Close

Choose the **Close** button to exit the Site Channel Configuration List dialog box and return to the CEC/IMC Manager main window. Any "**" (unconfigured and unsaved) PIMs appearing in the Configured/Active Sites list box will be removed and returned to the Configurable Sites list box.

3.8.4 VMIM Channel Configuration

The Con**V**entional **M**ASTR II/III **I**nterface **M**odule (**VMIM**) and **C**onventional **I**nterface **A**dapter (**CIA**) secondary interface rack couple conventional Tone or DC controlled base stations and conventional voting systems to the CEC/IMC switch. The CIA appears to the VMIM as an EDACS radio system. It provides the database capabilities that enable conventional channels to be patched or simulselected to trunked systems. Each VMIM/CIA set can provide thirty-two CEC/IMC conventional channel interfaces and a CEC/IMC may be equipped with

two VMIM/CIA sets thus providing up to a total of sixty-four conventional channel interfaces per CEC/IMC. A VMIM is formed by a Controller Board and up to eight Audio Boards.

VMIM-related channel configurations are performed from the Site Channel Configuration dialog box. Although not required, it is recommended that VMIM channel configurations be accomplished prior to CIA rack-related conventional channel configurations which are described later in CONVENTIONAL CHANNEL CONFIGURATION on page 3-145.

VMIM "Site" Selection

Prior to actual channel configuration, the interface module to be configured must be selected. From the CEC/IMC Manager menu bar select Configure System / CEC/IMC Configuration / VMIM. When VMIM is selected two new choices are made available: Audio Configuration (VMIM audio channel configuration) and Conv. Interface Adapter Configuration (conventional channel configuration). Select Audio Configuration to display the Site Channel Configuration List dialog box for VMIM configuration.

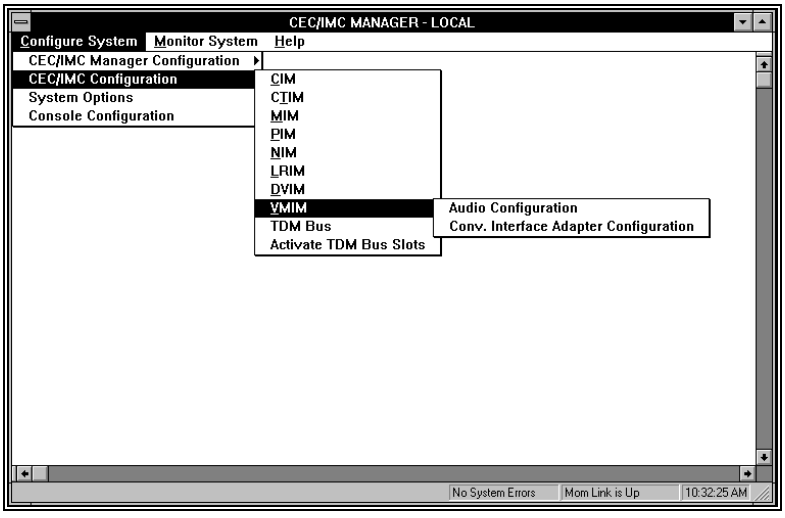
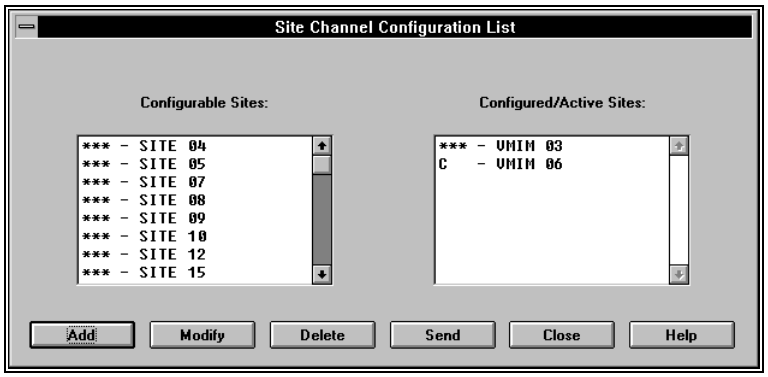


Figure 22 VMIM Configuration Menu

Each Site Channel Configuration List dialog box displays the configurable "sites" and configured/active "sites." An active "site" represents an active Controller Board control data link. In the case of a

VMIM, this represents an operating link between a CIA rack and the VMIM Controller Board.



Help

Choose the **Help** command button to access the Help function. (Help is also available by pressing the **F1** key.)

Configurable Sites:
The Configurable Sites list box displays all inactive unconfigured VMIM interface modules. If a VMIM appears in this box, no channel configuration exists at the CEC/IMC Manager and no active Controller Board control data link exists at the CEC/IMC for the corresponding site assignment number, and the VMIM may be selected for configuration. Any number of these available VMIMs may be selected at one time to be added to the Configured/Active list box for configuration.

Configured/Active Sites:
The Configured/Active Sites list box displays VMIMs which have been added but not yet channel-configured, VMIMs which have had previous channel configurations performed, and those which have been previously channel-configured and have an active Controller Board control data link. Before an interface module can be channel-configured, it must be listed in the Configured/Active Sites list box. Any number of the available VMIMs may be selected at one time for modification in the Site Channel Configuration dialog box. All selected VMIMs in this list will also be listed in the "**Save As...**" dialog box that is accessed from the Site Channel Configuration dialog box. For an explanation of the possible prefixes see Table 1 Configured/Active Sites Prefix Definitions, on page 3-25.

Add

Choose the **Add** button to move a selected VMIM from the Configurable Sites list box and "add" it to the Configured/Active Sites list box where it can be selected for configuration. If upon adding a VMIM, a configuration data file exists on the CEC/IMC Manager's hard disk drive from a previous add and delete, it will be added to the Configured/Active Sites list box with its configuration data file (with a ** prefix). This previous configuration may be modified, saved, and sent as needed.

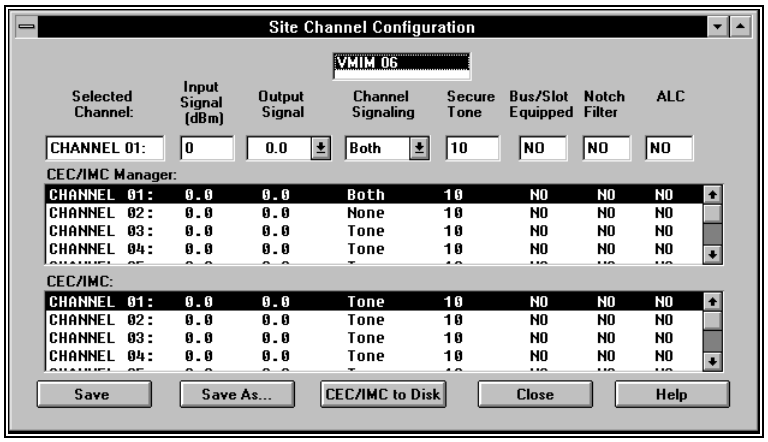
Modify

Choosing the **Modify** button will display the Audio Interface Type dialog box, select the Audio Board option button, then choose **OK**. The Site Channel Configuration dialog box will be displayed. (The T1/E1 Interface Card is not supported for the VMIM.)

Delete

Choose the **Delete** button to remove ("delete") a selected configured or unconfigured VMIM from the Configured/Active Sites list box to the Configurable Sites list box. Configured-and-active VMIMs cannot be "deleted." This delete function does not remove the channel configuration files from the CEC/IMC Manager's hard disk drive. Therefore, if the deleted VMIM is subsequently added back to the Configured/Active Sites list box using the **Add** button, the previous channel configuration is not lost (this configuration data must be re-saved in the Site Channel Configuration dialog box before it can be resent to the CEC/IMC).

VMIM Audio Board Channel Configuration



All channel parameters are configured from the Site Channel Configuration dialog box. Only those VMIMs which were selected in the Site Channel Configuration List dialog box are available for channel configuration. The selected VMIMs are displayed in a list box at the top center of the dialog box.

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

View Current CEC/IMC Manager Channel Configuration

The upper list box in the Site Channel Configuration dialog box, labeled "CEC/IMC Manager," displays the current channel configurations stored on the CEC/IMC Manager hard disk for the currently selected VMIM. As the edit fields above this list box are modified for a selected channel, the changes will appear also in this list box for the selected channel.

View Current CEC/IMC Channel Configuration

The lower list box in the Site Channel Configuration dialog box, labeled "CEC/IMC," displays the current channel configurations stored at the CEC/IMC for the currently selected VMIM interface module. Information within this box updates only after **Send** is performed from the preceding Site Channel Configuration List dialog box.

CEC/IMC to Disk

Choose the **CEC/IMC to Disk** button to write the current CEC/IMC configuration data to the CEC/IMC Manager hard disk. This action will overwrite the current CEC/IMC Manager configuration for the selected interface module. This function is useful if the CEC/IMC Manager configuration database is lost for any reason. A difference between CEC/IMC and CEC/IMC Manager databases will be evident by comparing the CEC/IMC Manager and CEC/IMC list boxes in the Site Channel Configuration dialog box. Ensure that the CEC/IMC configuration is correct, then choose the **CEC/IMC to Disk** button to restore the CEC/IMC Manager configuration database for the selected interface module.

Channel Selection

Select a channel (1 thru 32) for configuration from the CEC/IMC Manager channel list box, only one channel may be selected at a time. The selected channel and its configuration data will be displayed in the edit fields above the CEC/IMC Manager list box.

Input Signal Level (dBm)

This setting establishes the signal level in dBm (600-ohm impedance; 0 dBm = 1 milliwatt) applied to the selected channel's line input. Enter (type) the required value in the text box. The setting should be equal to the voice peak (test tone) level applied to the channel's line input. Voice peak levels are +10 dBm greater than average voice levels. The valid range is -25.0 dBm to +12.0 dBm in 0.5 dBm increments. The program automatically rounds-off non-0.5 dBm fractional entries to the nearest 0.5 dBm point. Input Signal Level default = 0 dBm.

NOTE

If Automatic Level Control (ALC) is disabled for the selected channel, subtract 1.5 dBm from the required Input Signal Level setting. For example, if the required input signal level is -10 dBm, enter -11.5 dBm. ALC is disabled by setting the ALC text box to "NO."

LBI-38938 contains a line level adjustment overview section which contains general information and general recommendations for both input and output level settings.

Output Signal Level (dBm)
This setting establishes the signal level in dBm (600-ohm impedance; 0 dBm = 1 milliwatt) sent out by the selected channel's line output. The setting specifies the voice peak (test tone) level sent out by the channel. The valid range is -25.0 dBm to +13.0 dBm in 0.5 dBm increments. Select the required value from the drop-down list box.. Output Signal Level default = 0 dBm.

Channel Signaling
For a VMIM interface module, this setting does not specify or influence control signaling sent out by the respective CI Board's channel to a conventional base station. All utilized channels should be set to "NONE." CI Board-related Secur-It™/function/hold tone level settings necessary for tone-controlled conventional base stations are accomplished by the 2175 Hz Hold Tone Level (dBm) setting in the Tone Controlled Station State Table Mapping dialog box, which is a sub-box of the Conventional Channel Configuration dialog box.

Secure Tone
This setting is not used for a VMIM. The 2175 Hz Hold Tone is set from the Conventional Channel Configuration dialog box.

NOTE

The secure tone and transmit hold tone are set on a per Audio Board basis. For example, setting channel 2 equal to 5 dBm will simultaneously set channels 1, 3 and 4 equal to 5 dBm.

Bus/Slot Equipped
All utilized channels within an interface module must be allocated a time slot on the CEC/IMC TDM network. Allocate a time slot to the selected channel by setting Bus/Slot Equipped to "YES." A channel will not route audio correctly if is not allocated a time slot. Set all unused channels to "NO," (the default setting).

Notch Filter
Do not enable the notch filter on any utilized channel for a VMIM. Enter (type) "NO" in the text box.

ALC

CAUTION

DO NOT enable ALC for any channel if the respective Audio Board part number is 19D903302P1 (any revision).

Automatic Level Control (ALC) provides compensation for signal level variances in a channel line input signal. As required, enable ALC for the selected channel by entering "YES" in the ALC text box or disable it by entering "NO."

Save and Send VMIM Configuration

When channel configuration of the selected VMIM is complete, the Site Channel Configuration dialog box changes must be sent to the CEC/IMC before the changes will take effect. This reprograms the VMIM Controller Boards. However, it is important to save the new configuration prior to sending it to the CEC/IMC because a send will send the last configuration that was saved to disk; saving first ensures that the actual CEC/IMC channel configuration will be the same as the channel configuration stored on the CEC/IMC Manager hard disk. To save and send configurations, action is required first in the Site Channel Configuration dialog box and then in the Site Channel Configuration List dialog box.

Site Channel Configuration dialog box

Save

Choose the **Save** button to perform an immediate save of the currently selected VMIM channel configuration. Other VMIMs displayed in the list box located at the top of the dialog box are not saved. This channel configuration is saved on the CEC/IMC Manager's hard disk drive. Any previous channel configuration for the VMIM, if present, is erased and replaced with the current channel configuration. If the CEC/IMC Manager is running remotely or as a part of the EDACS Network Manager, this configuration is saved on the CEC/IMC Manager server, typically local to the CEC/IMC; it is not saved at the remote location.

Save As...

Choose the **Save As…** button to allow the currently selected VMIM channel configurations to be saved as a different VMIM. It is provided to speed configurations when similar configurations are required. Upon

choosing **Save As…** a small dialog box (see Figure 17 on page 3-34) will appear which allows selection of a new VMIM number. Select the desired VMIM from one of the choices in the drop-down list box, the choices listed are the selected VMIMs in the Configured/Active Sites list box. Like **Save**, **Save As…** stores channel configuration on the CEC/IMC Manager server.

Close

Choose the **Close** button to exit the Site Channel Configuration dialog box and return to the Site Channel Configuration List dialog box. If any changes have been made and not saved, you will be prompted (Write Changes to Disk?) to save and exit (**Yes**), exit without saving (**No**), or cancel the **Close** command and remain in the dialog box (**Cancel**).

Site Channel Configuration List dialog box

Send

Choose the **Send** button to send the site channel configuration data to the respective interface module. This procedure must be performed before the interface module will operate with the new configuration. Only configured and configured-and-active (C and C/A prefixes) configurations may be sent. All configuration data is sent to the MOM Controller Board; the Audio configuration is sent directly out from there to the respective interface module Controller Board. A "Send to Site Successful" message will be received to confirm that the data was received by the interface module Controller Board. Bus Slot configuration data is compared to the current configuration at the CEC/IMC Manager; if different, it is sent to the MOM Controller Board (if not, no further action is taken by the system) and when the MOM Controller Board receives this new data it will send an acknowledgment message back to the CEC/IMC Manager, which will then display the confirmation box: "Do you want to activate TDM Bus Slots? OK - will cause all CTRL boards to reset." Choose **OK** to activate TDM Bus Slots (resetting Controller Boards) with the new Bus Slot configuration data, choose **Cancel** to not activate TDM Bus Slots with the new Bus Slot configuration data (keeping the previous configuration) and return to the Site Channel Configuration List dialog box.

Close

Choose the **Close** button to exit the Site Channel Configuration List dialog box and return to the CEC/IMC Manager main window. Any

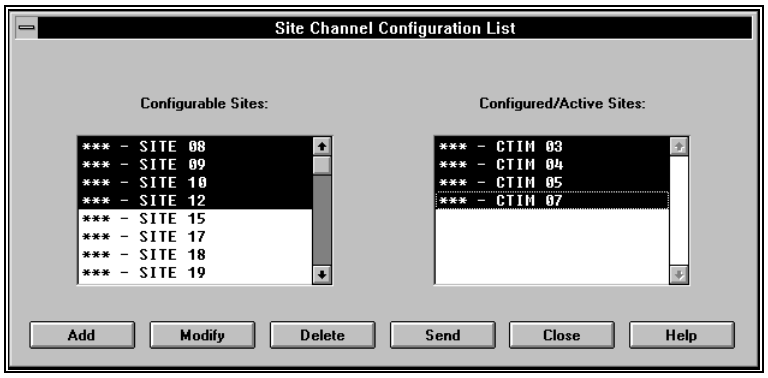
"**" (unconfigured and unsaved) VMIMs appearing in the Configured/Active Sites list box will be removed and returned to the Configurable Sites list box.

3.8.5 CTIM Channel Configuration

The interface between the CEC/IMC and a Centralized Telephone Interconnect System (CTIS) is accomplished with a **C**entralized **T**elephone **I**nterconnect **M**odule (**CTIM**). The CTIM enables radio users and dispatchers to access land-line telephone systems. The CTIM consists of a Controller Board and up to five Audio Boards, enabling a CTIM to provide up to 20 channels for CTIS equipment.

CTIM "Site" Selection

Prior to actual channel configuration, the interface module to be configured must be selected. From the CEC/IMC Manager menu bar select Configure System / CEC/IMC Configuration / CTIM to display the Site Channel Configuration List dialog box for that module.



Each Site Channel Configuration List dialog box displays the configurable "sites" and configured/active "sites." An active "site" represents an active Controller Board control data link. In the case of a CTIM, this represents an operating link between a centralized telephone interconnect system and the CTIM Controller Board.

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

Configurable Sites:
The Configurable Sites list box displays all unconfigured site-type interface modules. If a CTIM appears in this box, no channel configuration exists at the CEC/IMC Manager and no active Controller Board control data link exists at the CEC/IMC for the corresponding site assignment number. Any number of these available CTIMs may be selected at one time to be added to the Configured/Active Sites list box for configuration.

Configured/Active Sites:
The Configured/Active Sites list box displays CTIMs which have been added but not yet channel-configured, CTIMs which have had previous channel configurations performed, and CTIMs which have been previously channel-configured and have an active Controller Board control data link. Before any site-type interface module can be channel-configured, it must be listed in the Configured/Active Sites list box. Any number of the available CTIMs in this list may be selected at one time for modification in the Site Channel Configuration dialog box. All selected CTIMs in this list will also be listed in the "**Save As...**" dialog box that is accessed from the Site Channel Configuration dialog box. If necessary, refer to Configured/Active Sites Prefix Definitions, Table 1, on page 3-25 for an explanation of the prefixes.

Add

Choose the **Add** button to move a selected site from the Configurable Sites list box and "add" it to the Configured/Active Sites list box where it can be configured. If upon adding a site, a configuration data file exists on the CEC/IMC Manager's hard disk drive from a previous add and delete, the site will be added to the Configured/Active Sites list box with its configuration data file (with a ** prefix). This previous configuration may be modified, saved, and sent as needed.

Modify

Choose the **Modify** button to display the Audio Interface Type dialog box. Select Audio Board to activate the Site Channel Configuration dialog box, T1/E1 Interface is not supported for CTIMs. Audio Board configuration is discussed in detail in the subsequent section.

Delete

Choose the **Delete** button to remove ("delete") a selected configured or unconfigured CTIM from the Configured/Active Sites list box to the Configurable Sites list box. Configured-and-active CTIMs cannot be "deleted." This delete function does not remove channel configuration

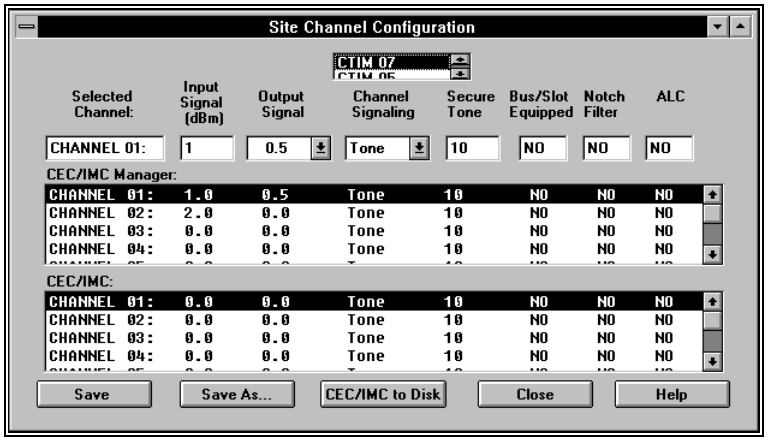
files from the CEC/IMC Manager's hard disk drive. Therefore, if the deleted CTIM is subsequently added back to the Configured/Active Sites list box via the **Add** button, the previous channel configuration is not lost (this configuration data must be saved in the Site Channel Configuration dialog box before it can be resent to the CEC/IMC).

Close

Choose the **Close** button to exit the Site Channel Configuration List dialog box and return to the CEC/IMC Manager main window. Any "**" (unconfigured and unsaved) CTIMs appearing in the Configured/Active Sites list box will be removed and returned to the Configurable Sites list box.

CTIM Audio Board Channel Configuration

This section describes configurations for channels within Audio Board-equipped site-type interface modules. All channel parameters are configured from the Site Channel Configuration dialog box. Only those CTIMs which were selected in the Site Channel Configuration List dialog box are available for channel configuration. Select the desired site-type interface modules to configure from the Configured/Active Sites list, or add the desired modules from the Configurable Sites list, if not already listed, as described earlier. Choose **Modify** to display the Audio Interface Type dialog box, select the Audio Board option button, (T1/E1 Interface Board is not supported for CTIM) then choose **OK** to display the Site Channel Configuration dialog box. The selected CTIMs are displayed in a list box at the top center of the dialog box.



Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

View Current CEC/IMC Manager Channel Configuration

The upper list box in the Site Channel Configuration dialog box, labeled "CEC/IMC Manager," displays the current channel configurations stored on the CEC/IMC Manager hard disk for the currently selected CTIM. As the edit fields above this list box are modified for a selected channel, the changes will appear also in this list box for the selected channel.

View Current CEC/IMC Channel Configuration

The lower list box in the Site Channel Configuration dialog box, labeled "CEC/IMC," displays the current channel configurations stored at the CEC/IMC for the currently selected site-type interface module. Information within this box updates only after **Send** is performed from the preceding Site Channel Configuration List dialog box.

CEC/IMC to Disk

Choose the **CEC/IMC to Disk** button to write the current CEC/IMC configuration data to the CEC/IMC Manager hard disk. This action will overwrite the current CEC/IMC Manager configuration for the selected interface module. This function is useful if the CEC/IMC Manager configuration database is lost for any reason. A difference between CEC/IMC and CEC/IMC Manager databases will be evident by comparing the CEC/IMC Manager and CEC/IMC list boxes in the Site Channel Configuration dialog box. Ensure that the CEC/IMC configuration is correct, then choose the **CEC/IMC to Disk** button to

restore the CEC/IMC Manager configuration database for the selected interface module.

Channel Selection
Select a channel (1 thru 32) for configuration from the CEC/IMC Manager channel list box, only one channel may be selected at a time. The selected channel and its configuration data will be displayed in the edit fields above the CEC/IMC Manager list box.

Input Signal Level (dBm)
This setting establishes the signal level in dBm (600-ohm impedance; 0 dBm = 1 milliwatt) applied to the selected channel's line input. Enter (type) the required value in the text box. The setting should be equal to the voice peak (test tone) level applied to the channel's line input. Voice peak levels are +10 dBm greater than average voice levels. Valid range is -25.0 dBm to 12.0 dBm, adjustable in 0.5 dBm increments. The program automatically rounds-off non-0.5 dBm fractional entries to the nearest 0.5 dBm. Input Signal Level default = 0 dBm.

NOTE

If Automatic Level Control (ALC) is disabled for the selected channel, subtract 1.5 dBm from the required Input Signal Level setting. For example, if the required input signal level is -10 dBm, enter -11.5 dBm. ALC is disabled by setting the ALC text box to "NO."

LBI-38938 contains a line level adjustment overview section which contains general information and general recommendations for both input and output level settings.

Output Signal Level (dBm)
This setting establishes the signal level in dBm (600-ohm impedance; 0 dBm = 1 milliwatt) sent out by the selected channel's line output. The setting specifies the voice peak (test tone) level sent out by the channel. The valid range is -25.0 dBm to 13.0 dBm in 0.5 dBm increments. Select the required value from the drop-down list box. Output Signal Level default = 0 dBm.

Channel Signaling
This drop-down list box specifies the type of channel signaling sent out by the selected channel for control of external equipment such as an EDACS trunked site or co-located mux equipment. Valid settings are "NONE" for no signaling, "TONE" for tone control signaling, "E&M" for M-lead control signaling, and "BOTH" for both tone and M-lead control signaling. Channel Signaling default = "NONE."

EDACS trunked sites require specialized tone control signaling for transmit keying. For a CTIM, all utilized channels require either a "TONE" or a "BOTH" setting. Specific tone level settings are accomplished via the "Secure Tone" text box described in the following paragraph.

Secure Tone
This setting establishes the level of the 2175 Hz secure tone and transmit hold tone sent out by the Audio Board's channel prior to and during a switch-to-site transmission. The set level is only utilized if Channel Signaling is "TONE" or "BOTH." Valid range is -10 dBm to 11 dBm, which specifies the secure tone level. The 2175 Hz transmit hold tone is always sent out 30 dBm below the secure tone setting.

NOTE

The secure tone and transmit hold tone are set on a per Audio Board basis. For example, setting channel 2 equal to 5 dBm will simultaneously set channels 1, 3 and 4 equal to 5 dBm.

Bus/Slot Equipped
All utilized channels within an interface module must be allocated a time slot on the CEC/IMC TDM network. Allocate a time slot to the selected channel by setting Bus/Slot Equipped to "YES." A channel will not route audio correctly if is not allocated a time slot. Set all unused channels to "NO," (the default setting).

NOTE

In earlier CEC/IMC firmware/software releases, slot allocations could only be made contiguously starting with channel one (1). In some systems this produced slot allocation inefficiencies – some slots had to be allocated but were never used. CEC/IMC software/firmware release 5.0 (and later) provides non-contiguous slot allocations. In this release, only those slots actually required need be allocated. For example, channels 1 and 4 can be allocated slots without allocating slots to channels 2 and 3.

Notch Filter

CAUTION

DO NOT enable the 2175 Hz notch filter for any channel if the respective Audio Board part number is 19D903302P1 (any revision).

Each Audio Board channel is equipped with a 2175 Hz notch filter circuit which when enabled eliminates destructive interference of the channel's 2175 Hz transmit keying tone. In some cases, this destructive interference or "talk down" can cause incorrect (early) trunked site channel drops. To enable the selected channel's notch filter, enter "YES" in the Notch Filter text box. Notch Filter default = "NO" (disabled).

A channel's 2175 Hz transmit keying tone level is established via the Secure Tone setting. Refer to the Secure Tone text box description above for details.

ALC

CAUTION

DO NOT enable ALC for any channel if the respective Audio Board part number is 19D903302P1 (any revision).

Automatic Level Control (ALC) provides compensation for signal level variances in a channel line input signal. As required, enable ALC for

the selected channel by entering "YES" in the ALC text box or disable it by entering "NO."

Save and Send CTIM Configurations

When channel configuration of the selected CTIM is complete, the Site Channel Configuration dialog box changes must be sent to the CEC/IMC before the changes will take effect. This reprograms the CTIM Controller Boards. However, it is important to save the new configuration prior to sending it to the CEC/IMC because a send will send the last configuration that was saved to disk; saving first ensures that the actual CEC/IMC channel configuration will be the same as the channel configuration stored on the CEC/IMC Manager hard disk. To save and send configurations, action is required first in the Site Channel Configuration dialog box and then in the Site Channel Configuration List dialog box.

Site Channel Configuration dialog box

Save

Choose the **Save** button to perform an immediate save of the currently selected CTIM channel configuration. Other CTIMs displayed in the list box located at the top of the dialog box are not saved. This channel configuration is saved on the CEC/IMC Manager's hard disk drive. Any previous channel configuration for the CTIM, if present, is erased and replaced with the current channel configuration. If the CEC/IMC Manager is running remotely or as a part of the EDACS Network Manager, this configuration is saved on the CEC/IMC Manager server, typically local to the CEC/IMC; it is not saved at the remote location.

Save As...

Choose the **Save As…** button to allow the currently selected CTIM channel configurations to be saved as a different CTIM. It is provided to speed configurations when similar channel configurations are required. Upon choosing **Save As…** a small dialog box (see Figure 17 on page 3-34) will appear which allows selection of a new CTIM number. Select the desired CTIM number from one of the choices in the drop-down list box, the choices listed are the selected CTIMs in the Configured/Active Sites list box. Like **Save**, **Save As…** stores channel configuration on the CEC/IMC Manager server.

Close

Choose the **Close** button to exit the Site Channel Configuration dialog box and return to the Site Channel Configuration List dialog box. If any changes have been made and not saved, you will be prompted (Write Changes to Disk?) to save and exit (**Yes**), exit without saving (**No**), or cancel the **Close** command and remain in the dialog box (**Cancel**).

Site Channel Configuration List dialog box

Send

Choose the **Send** button to send the site channel configuration data to the respective interface module. This procedure must be performed before the interface module will operate with the new configuration. Only configured and configured-and-active (C and C/A prefixes) configurations may be sent. All configuration data is sent to the MOM Controller Board; the Audio configuration is sent directly out from there to the respective interface module Controller Board. A "Send to Site Successful" message will be received to confirm that the data was received by the interface module Controller Board. Bus Slot configuration data is compared to the current configuration at the CEC/IMC Manager; if different, it is sent to the MOM Controller Board (if not, no further action is taken by the system) and when the MOM Controller Board receives this new data it will send an acknowledgment message back to the CEC/IMC Manager, which will then display the confirmation box: "Do you want to activate TDM Bus Slots? OK - will cause all CTRL boards to reset." Choose **OK** to activate TDM Bus Slots (resetting Controller Boards) with the new Bus Slot configuration data, choose **Cancel** to not activate TDM Bus Slots with the new Bus Slot configuration data (keeping the previous configuration) and return to the Site Channel Configuration List dialog box.

Close

Choose the **Close** button to exit the Site Channel Configuration List dialog box and return to the CEC/IMC Manager main window. Any "**" (unconfigured and unsaved) CTIMs appearing in the Configured/Active Sites list box will be removed and returned to the Configurable Sites list box.

3.9 CONFIRMED CALL

If confirmed call is enabled for the group/unit at the System Manager, a unit that performs a confirmed call will not be allowed to transmit on a wide area (multisite) call until all sites that should pick up the call have responded with a working channel assignment or until a time-out period expires. If there are sites that may cause excessive delays, exempting those sites from the confirmation process will allow calls to proceed without waiting for the exempted site's channel assignment. For example, it may be desirable to disable confirmed call for a SCAT radio system since its single channel could cause unacceptable delays in confirmed wide area group calls. Note that if this confirmed call site setting is disabled, unit and group calls to the site will not be confirmed even if the confirmed call unit/group setting is enabled at the System Manager; the CEC/IMC Manager site confirmed call setting has priority over the unit and group settings received from the System Manager.

This option is used to modify the behavior of the CEC/IMC confirmed call tracking database and is accomplished using the System Options dialog box. From the CEC/IMC Manager menu bar select Configure System / System Options / Confirm Call to display the System Options dialog box.

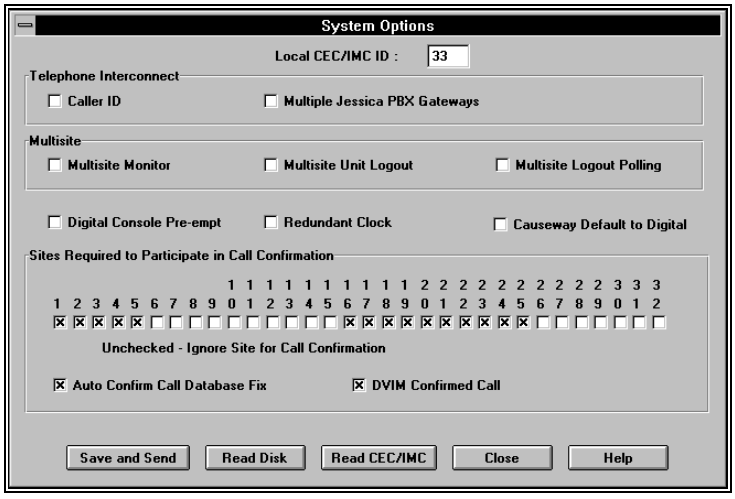


Figure 23 System Options Dialog Box

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

Close

Choose the **Close** button to exit the System Options dialog box and return to the CEC/IMC Manager main window. If any changes have been made and not saved, you will be prompted (Write Changes to Disk?) to save and exit (**Yes**), exit without saving (**No**), or cancel the **Close** command and remain in the dialog box (**Cancel**).

From this dialog box specific sites may be "exempted" from the call confirmation process. Select the check box for those sites (1–32) **required** to participate in the call confirmation process.

Auto Confirm Call Database Fix

In addition, removing sites determined to be in Failsoft 2 (CEC/IMC to site link not working) or not present in the system (MIM not active) from the confirmed call expected response database may be enabled or disabled. The MOM normally removes sites that are determined to be either in Failsoft 2 or do not have an active MIM in the system from the confirmed call expected response database. This causes confirmed calls to fail once for either of these error conditions, and then proceed successfully. If this check box is unselected (disabled) confirmed calls

will continue to fail (10 second delay on every call) until the failed site is restored (normal Confirm Call operation).

DVIM Confirmed Call

DVIM Confirmation/Console Tracking allows the DVIM to filter radio originated digital group calls if those groups are programmed at consoles or logging recorders. The DVIM maintains a database of groups presently programmed at consoles and logging recorders. If a radio originated digital group call is received on a group that is not programmed at a console/logging recorder, the DVIM will not assign a DVIU and will not process the call. This will prevent wasting a DVIU resource unnecessarily.

NOTE!!

ALL working channel GETCs must be verified to have "Remote Digital Delay" set to a value greater than "Confirm Call Timeout." This is necessary to prevent digital confirmed calls processed through Confirm Call Timeout being immediately dropped by Remote Digital Delay.

The current operation of the Confirmed Group Call feature does not include confirmation by the DVIM when a Voice Guard group call is processed. This feature enhancement is programmable (Enable/ Disable) from the CEC/IMC Manager under Confirmed Call options. Confirmed Group Call operation will continue to perform as in previous releases when this enhanced feature is disabled (the default setting on MIM NOVRAM clear). Enabling this feature will provide call confirmation by the DVIM when a Voice Guard group call is processed.

Save and Send

Choose the **Save and Send** button to save the new Confirm Call configuration to the CEC/IMC Manger hard disk drive and also send the new configuration to the CEC/IMC. A verification message is displayed at the CEC/IMC Manager when the CEC/IMC Manager has saved the new configuration to disk and when the CEC/IMC receives the new configuration.

Read Disk

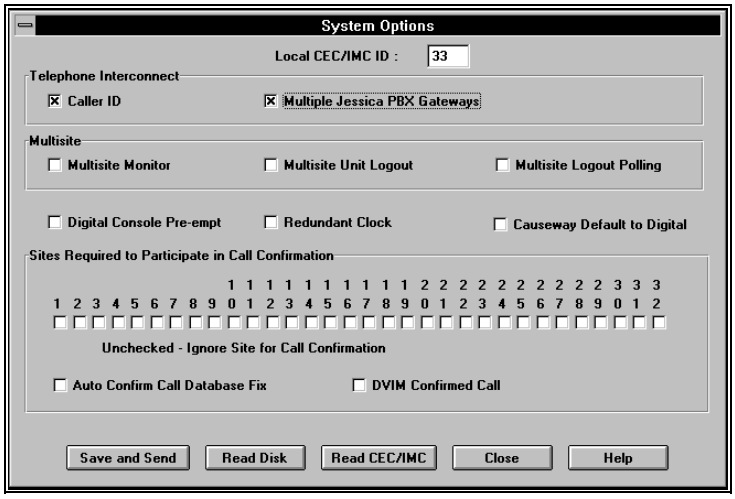
Choose the **Read Disk** button to view the current configuration stored at the CEC/IMC Manager hard disk.

Read CEC/IMC

Choose the **Read CEC/IMC** button to view the current Confirm Call configuration at the CEC/IMC.

3.10 TELEPHONE INTERCONNECT

Two Telephone Interconnect options are available in the System Options dialog box. From the CEC/IMC Manager menu bar select Configure System / Systems Options / Telephone Interconnect.



CAUTION

Do not enable either of these two options until verifying that your particular site software versions support these options! Consult *EDACS® Jessica PBX Gateway System Manual* (LBI-39000) and *EDACS® Jessica PBX Gateway PI User's Manual* (LBI-39040) for detailed system requirements and configuration concerning these two options.

Caller ID
This feature allows Caller ID on inbound interconnect calls. This is done by assigning a "LID" to each telephone line. The NIM will now track phone calls by searching the channels for the active phone line to pick up radio keys/unkeys. This feature is presently not supported in the Site Controller or GETC interface to accept caller based CTIS drops. It also requires Jessica software and configuration changes to assign IDs to phone lines. When this feature is enabled the caller ID is sent to the site instead of 16383 system ID.

Multiple Jessica PBX Gateways
Use this option when an EDACS system that is "StarGated" has more than one Jessica connected at multiple IMCs. This option will cause caller based drops to be sent to the site, and when this feature is enabled the caller ID is sent to the site instead of the 16383 system ID.

3.11 CONSOLE CONFIGURATION

Console configuration consists of CIM channel configuration, setting up console user profiles, C3 Maestro console hardware configuration, establishing privilege lists, C3 Modular/Desktop console configuration, and viewing patch/simulselects. Each CEC/IMC can support up to 32 consoles. From the CEC/IMC Manager menu bar select Configure System / Console Configuration to display the Console Configuration menu, shown in Figure 24. CIM channel configuration is done from CEC/IMC Configuration as described in the following section (Section 3.11.1).

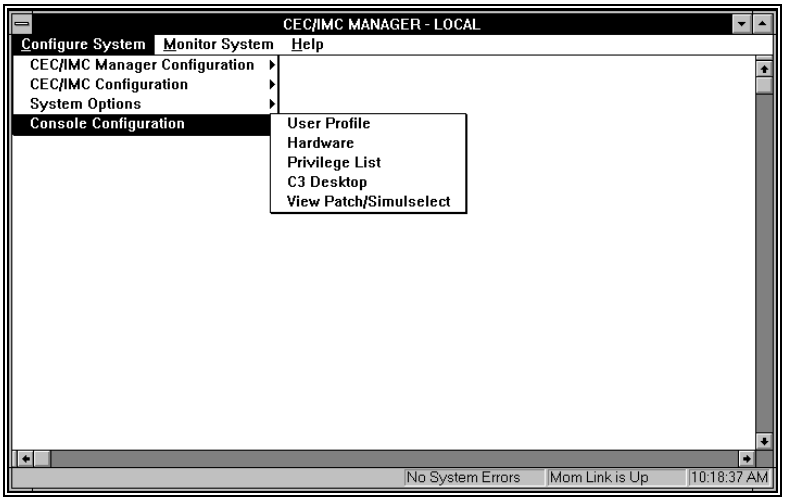


Figure 24 Console Configuration Menu

3.11.1 CIM Channel Configuration

The CEC/IMC is connected to the EDACS C3 Maestro, C3 Maestro for Windows NT, and C3 Modular/Desktop dispatch consoles by the **C**onsole **I**nterface **M**odule (**CIM**). Each CIM is assigned a unique console assignment number (1 thru 32) within the CEC/IMC. This number corresponds to and matches the console assignment number set by the 5-bit DIP switch setting on the interface module Controller Board.

CIM "Console" Selection

Prior to actual channel configuration, the interface module to be configured must be selected. From the CEC/IMC Manager menu bar select Configure System / CEC/IMC Configuration / CIM (see Figure 12 on page 3-23) to display the Console Channel Configuration List dialog box, Figure 25.

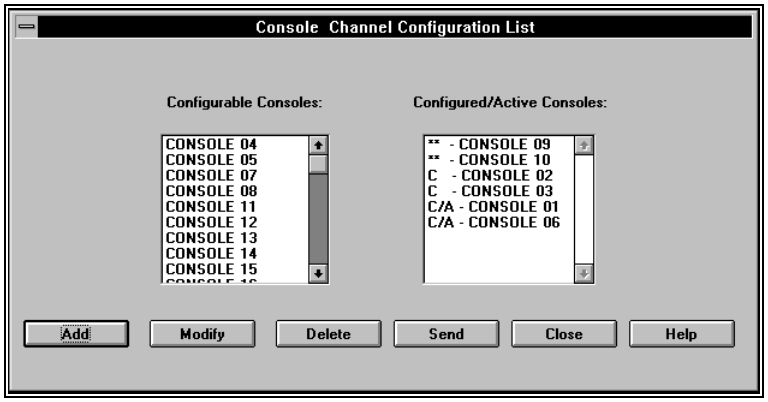


Figure 25 Console Channel Configuration List Dialog Box

Each Console Channel Configuration List dialog box displays the configurable consoles and configured/active consoles. An active console represents an operating link between a dispatch console and the CIM Controller Board.

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

Configurable Consoles:
The Configurable Consoles list box displays all inactive unconfigured console interface modules. If a console appears in this box, no channel configuration exists at the CEC/IMC Manager and no active Controller Board control data link exists at the CEC/IMC for the corresponding console assignment number. Any number of these available consoles may be selected at one time to be added to the Configured/Active list box for configuration.

Configured/Active Consoles:
The Configured/Active Consoles list box displays consoles which have been added but not yet channel-configured, consoles which have had previous channel configurations performed, and consoles which have been previously channel-configured and have an active Controller Board control data link. Before a console interface module can be channel-configured, it must be listed in the Configured/Active Consoles list box. Any number of the available consoles in this list may be selected at one time for modification in the Console Channel Configuration dialog box. All of the selected

consoles from this list will also be listed in the "**Save As...**" dialog box that is accessed from the Console Channel Configuration dialog box. The particular state indicated by the prefix is defined in Table 1, Configured/Active Sites Prefix Definitions on page 3-25.

Add

Choose the **Add** button to move a selected console from the Configurable Consoles list box and "add" it to the Configured/Active Console list box where it can be configured. If upon adding a console, a configuration data file exists on the CEC/IMC Manager's hard disk drive from a previous add and delete, the console will be added to the Configured/Active Consoles list with its configuration data file (with a ** prefix). This previous configuration may be modified, saved, and sent as needed.

Modify

Choose the **Modify** button to display the Console Channel Configuration dialog box to continue console channel configuration. At least one console must be selected in the Configured/Active Consoles list box prior to choosing **Modify** to display the Console Channel Configuration dialog box.

Delete

Choose the **Delete** button to remove ("delete") a selected configured or unconfigured console from the Configured/Active Consoles list box to the Configurable Consoles list box. Configured-and-active consoles cannot be "deleted." This delete function does not remove console channel configuration files from the CEC/IMC Manager's hard disk drive. Therefore, if a deleted "console" is subsequently added back to the Configured/Active Consoles list box using the **Add** button, the previous channel configuration is not lost (this configuration data must be resaved in the Console Channel Configuration dialog box before it can be resent to the CEC/IMC).

Close

Choose the **Close** button to exit the Console Channel Configuration List dialog box and return to the CEC/IMC Manager main window. Any "**" prefixed consoles appearing in the Configured/Active Consoles list box will be removed and returned to the Configurable Consoles list box.

CIM Audio Board Channel Configuration

All channel parameters are configured from the Console Channel Configuration dialog box, Figure 26. Only those consoles which were selected in the Console Channel Configuration List dialog box are available for channel configuration. Select the desired console interface modules to configure from the Configured/Active Consoles list, or add the desired modules from the Configurable Consoles list, if not already listed. Choose **Modify** to display the Console Channel Configuration dialog box.

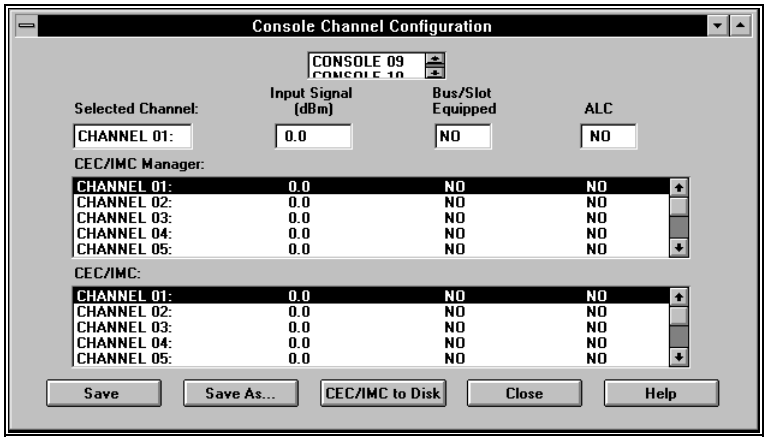


Figure 26 Console Channel Configuration Dialog Box

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

View Current CEC/IMC Manager Channel Configuration

The upper list box in the Console Channel Configuration dialog box, labeled "CEC/IMC Manager," displays the current channel configurations stored on the CEC/IMC Manager hard disk for the currently selected console interface module. As the edit fields above this list box are modified for a selected channel, the changes will appear also in this list box for the selected channel.

View Current CEC/IMC Channel Configuration

The lower list box in the Console Channel Configuration dialog box, labeled "CEC/IMC," displays the current channel configurations stored

at the CEC/IMC for the currently selected console interface module. Information within this box updates only after **Send** is performed from the preceding Console Channel Configuration List dialog box.

CEC/IMC to Disk

Choose the **CEC/IMC to Disk** button to write the current CEC/IMC configuration data to the CEC/IMC Manager hard disk. This action will overwrite the current CEC/IMC Manager configuration for the selected console. This function is useful if the CEC/IMC Manager configuration database is lost for any reason. A difference between CEC/IMC and CEC/IMC Manager databases will be evident by comparing the CEC/IMC Manager and CEC/IMC list boxes in the Console Channel Configuration dialog box. Ensure that the CEC/IMC configuration is correct, then choose the **CEC/IMC to Disk** button to restore the CEC/IMC Manager configuration database for the selected console.

Channel Selection

Select a channel (1 thru 32) for configuration from the CEC/IMC Manager channel list box, only one channel may be selected at a time. The selected channel and its configuration data will be displayed in the edit fields above the CEC/IMC Manager list box.

Input Signal Level (dBm)

This setting establishes the signal level in dBm (600-ohm impedance; 0 dBm = 1 milliwatt) applied to the selected channel's line input. Enter the required value in the text box. The setting should be equal to the voice peak (test tone) level applied to the channel's line input. Voice peak levels are +10 dBm greater than average voice levels. Valid range is -25.0 dBm to 12.0 dBm, adjustable in 0.5 dBm increments. The program automatically rounds-off non-0.5 dBm fractional entries to the nearest 0.5 dBm point. Input Signal Level default = 0 dBm.

NOTE

If Automatic Level Control (ALC) is disabled for the selected channel, subtract 1.5 dBm from the required Input Signal Level setting. For example, if the required input signal level is -10 dBm, enter -11.5 dBm. ALC is disabled when the ALC text box is "NO."

LBI-38938 contains a line level adjustment overview section which contains general information and general recommendations for both input and output level settings.

Bus/Slot Equipped
Only one TDM bus time slot is normally required for each console since there is only one transmit channel per console. However, if the Call Director option will be used with the console two slots are required (see Note below).

NOTE

In earlier CEC/IMC firmware/software releases, slot allocations could only be made contiguously starting with channel one (1). In some systems this produced slot allocation inefficiencies—some slots had to be allocated but were never used. For example a CIM supporting a Call Director had to be allocated four (4) slots so CIM channel 4 could be used for Call Director transmit audio. In this release, only those slots actually required need be allocated; therefore, a CIM supporting a Call Director requires only two (2) slots—one for channel 1 and one for channel 4.

ALC

CAUTION

DO NOT enable ALC for any channel if the respective Audio Board part number is 19D903302P1 (any revision).

Automatic Level Control (ALC) provides compensation for signal level variances in a channel line input signal. As required, enable ALC for the selected channel by entering "YES" in the ALC text box or disable it by entering "NO."

Save and Send CIM Channel Configurations

When channel configuration of the selected console is complete, the Console Channel Configuration dialog box changes must be sent to the CEC/IMC before the changes will take effect. This reprograms the CIM Controller Boards. However, it is important to save the new

configuration prior to sending it to the CEC/IMC because a send will send the last configuration that was saved to disk; saving first ensures that the actual CEC/IMC channel configuration will be the same as the channel configuration stored on the CEC/IMC Manager hard disk. To save and send configurations, action is required first in the Console Channel Configuration dialog box and then in the Console Channel Configuration List dialog box.

Console Channel Configuration dialog box

Save

Choose the **Save** button to perform an immediate save of the currently selected console interface module's channel configuration. Other consoles displayed in the list box located at the top of the dialog box *are not* saved. This channel configuration is saved on the CEC/IMC Manager's hard disk drive. Any previous channel configuration for the console, if present, is erased and replaced with the current channel configuration. If the CEC/IMC Manager is running remotely or as part of the EDACS Network Manager, this configuration is saved on the CEC/IMC Manager server, typically local to the CEC/IMC; it is not saved at the remote location.

Save As...

Choose the **Save As…** button to allow the currently selected console interface module channel configurations to be saved as a different console interface module. This function is provided to speed configurations when similar console configurations are required. Upon choosing **Save As…** a small dialog box, (see Figure 17 on page 3-34), will appear which allows selection of a new console number. Select the desired console number from one of the choices in the drop-down list box, the choices listed are the selected consoles in the Configured/Active Consoles list box. Like **Save**, **Save As…** stores channel configuration on the CEC/IMC Manager server.

Close

Choose the **Close** button to exit the Console Channel Configuration dialog box and return to the Console Channel Configuration List dialog box. If any changes have been made and not saved, you will be prompted (Write Changes to Disk?) to save and exit (**Yes**), exit without saving (**No**), or cancel the **Close** command and remain in the dialog box (**Cancel**).

Console Channel Configuration List dialog box

Send

Choose the **Send** button to send the console channel configuration data to the respective interface module. This procedure must be performed before the interface module will operate with the new configuration. Only configured and configured-and-active (C and C/A prefixes) configurations may be sent. All configuration data is sent to the MOM Controller Board; the Audio configuration is sent directly out from there to the respective interface module Controller Board. A "Send to Console Successful" message will be received to confirm that the data was received by the interface module Controller Board. Bus Slot configuration data is compared to the current configuration at the CEC/IMC Manager; if different, it is sent to the MOM Controller Board (if not, no further action is taken by the system) and when the MOM Controller Board receives this new data it will send an acknowledgment message back to the CEC/IMC Manager, which will then display the confirmation box: "Do you want to activate TDM Bus Slots? OK - will cause all CTRL boards to reset." Choose **OK** to activate TDM Bus Slots (resetting Controller Boards) with the new Bus Slot configuration data, choose **Cancel** to not activate TDM Bus Slots with the new Bus Slot configuration data (keeping the previous configuration) and return to the Console Channel Configuration List dialog box.

Close

Choose the **Close** button to exit the Console Channel Configuration List dialog box and return to the CEC/IMC Manager main window. Any "**" prefixed consoles appearing in the Configured/Active Consoles list box will be removed and returned to the Configurable Consoles list box.

3.11.2 Console User Profile Configuration

This option is used to configure each console in the system and its associated user profiles. Ten different profile set-ups may be configured for each console, each having a unique personality. These setups are done from the Console User Profile Configuration dialog box, Figure 27. From the CEC/IMC Manager menu bar select Configure System / Console Configuration / User Profile to display the Console User Profile Configuration dialog box.

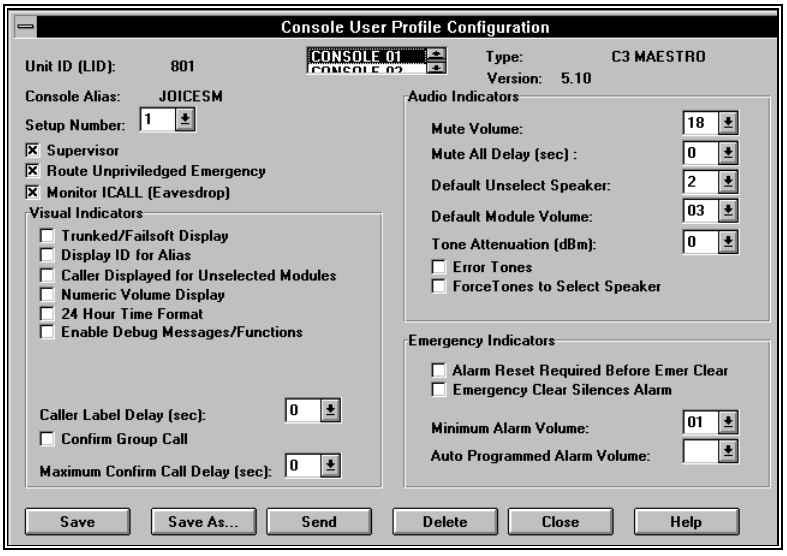


Figure 27 Console User Profile Configuration Dialog Box

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

Console Profiles

The Type and Version fields in the upper right corner of the Console User Profile Configuration dialog box identify the currently selected console type and software version number. Console types include C3 Maestro consoles ("MAESTRO"), C3 Modular/Desktop consoles ("MODULAR"), and C3 Maestro for Windows NT ("MAESTRO NT"). If no console exists, the Type field will be "NONE" and the Version field will be "0.00." Console types are initially defined at the System Manager.

Console

This list box at top center of dialog box selects which console from those selected in the Configured/Active Consoles list to be configured. Range = 1 - 32.

Unit ID (LID) and Console Alias

These fields specify the unit ID or "LID" (Logical ID) number and Alias associated with this console. The Unit ID must be in the 1 -

16382 range and must not conflict with other unit ID numbers in the System Manager's LID database. Number 16383 is the default for uninitialized consoles and indicates to the MOM Controller Board that the console is not configured. The Console Alias field defines an 8-character alias for each console. The default alias is "CONS XX." This alias is also used for display purposes, if a console initiates a call, its alias will be displayed on other consoles which are monitoring the call. There are three possible scenarios for Unit ID (LID) and Console Alias based on the version of System Manager in use (discussed below).

System Manager 6.0 and greater
In systems with a System Manager running V6.0 or greater software, the Unit ID (LID) and Console Alias fields are read only. This data must be programmed at the System Manager and then downloaded to the CEC/IMC Manager prior to Console User Profile configuration. (See SYSTEM MANAGER DATABASE UPLOADS.)

System Manager 5.0
In systems with a System Manager running V5.0 software, the Unit ID (LID) and Console Alias fields may be edited. The Unit ID values entered in these fields must be valid LIDs (existing at the System Manager) and identified as consoles at the System Manager, and be downloaded to the CEC/IMC Manager prior to Console User Profile configuration. (See SYSTEM MANAGER DATABASE UPLOADS.)

System Manager prior to 5.0
In systems with a System Manager running a version of software previous to 5.0, the Unit ID (LID) and Console Alias fields may be edited. The values entered in these fields must be valid LIDs at the System Manager.

All consoles with a unit ID less than 16383 are contained in the console unit ID database, and will be uploaded from the CEC/IMC Manager to the MOM Controller Board if so requested by a CEC/IMC Manager console upload from the File Transfer system option. The LID number in this field should match the selected console's LID in the System Manager LID database in a trunked configuration. In a pure conventional system, there is no System Manager database and the console ID number must not conflict with any conventional ID number in the system.

(Console) Setup Number
This drop-down list box displays which console user setup is currently being displayed on-screen. Select from this list box to view or configure specific console user setup data for each console. Ten (10) different set-ups are supported at each console.

Delete

Choose the **Delete** button to remove ("delete") a console user profile database from the CEC/IMC Manager hard disk. If the console is no longer used or the console never existed the database should be deleted. Deleting the console user profile database also deletes the console privilege list and C3 Modular/Desktop console configuration databases. A Message Box will be displayed asking you to confirm (**OK**) or cancel (**Cancel**) the **Delete** command.

Console User Setup Profiles

All other fields in the Console User Profile Configuration dialog box are configured specifically for each user setup. The Supervisor field is by itself as it has special implications, the remaining fields are separated into three (3) general groupings: Visual Indicators, Audio Indicators, and Emergency Indicators.

Supervisor

Select this check box if the user on this shift is a supervisor. Certain privileges are granted to supervisory consoles that are not granted to non-supervisory consoles. When selected, two additional check box options will appear (If Supervisor is subsequently disabled and then re-enabled, the previous selections of the below options will be displayed):

Route Unprivileged Emergency

Select this check box to route all emergencies to the console regardless of the privilege list entries. Unselect to route only emergencies from entities within the console's privilege list to the console. This field is not enabled for non-supervisor consoles.

Monitor ICALL (Eavesdrop)

When this option enabled by selecting this check box, a supervisory dispatcher will be able to monitor or "eavesdrop" on Individual Calls to and from any unit which is programmed at the C3 Maestro console. If this field is not selected (disabled) or if the Supervisor check box is not selected, the console will only be able to perform standard Individual Call functions. See Table 4, Console Individual Call Levels below

for definitions of the three (3) possible levels of Individual Call functionality each C3 Maestro console may have.

Visual Indicators

Trunked/Failsoft Display
Select this check box to enable the trunked operational status indicators and Failsoft tones at the console. Selecting this check box will also display the Audible Trunked/Failsoft Tone check box in the Audio Indicators group, see the discussion of the Audible Trunked/Failsoft Tone check box under Audio Indicators for function of this checkbox. If enabled, the console will sound a Failsoft tone (if the Audible Trunked/Failsoft Tone check box is selected) in its default unselect speaker and display one of the following states when a status transition occurs:

"TRNK"– Trunked Operation
"TRFS" – Combined Trunk / Failsoft Operation
"FS2" – Failsoft Operation

Unselect to disable this function.

Display ID for Alias
Select this check box to display IDs (GID, LID, CID, etc.,) of incoming calls in the respective console's module title bars. Unselect to display labels (aliases) of incoming calls.

Caller Display for Unselected Modules
Used to indicate whether or not the dispatcher wants labels displayed on all incoming calls or just on selected incoming calls.

Numeric Volume Display
Select this check box to display a numeric volume at the console. Unselect to display a volume bar.

24 Hour Time Format
Select this check box to the display time at the console in a 24-hour format. Unselect to display the time in a 12-hour format. This option is not available for C3 Maestro for Windows NT consoles.

Enable Debug Messages/Functions
Select this check box to display debug messages and functions at the console. This option is not available for C3 Maestro for Windows NT consoles.

Labeling for Console Call
Select this check box to force alphanumeric alias displays for all incoming console originated calls. Unselect to force logical displays of

console originated calls. This field is used only for C3 Modular/Desktop consoles.

Caller Label Delay
Time delay, in seconds, that the CALLER is displayed after the call has dropped. This delay allows the dispatcher to see who made the call for a short time after the call was dropped. There is a built-in two (2) second delay for C3 Modular/Desktop consoles which will be added to any value (0 - 5) selected from the drop-down list box.

Confirm Group Call
Select this check box to enable confirmed call on group and digital PTTs. Unselect to disable this function.

Maximum Confirm Call Delay
This is the maximum time in seconds that a confirmed PTT will hold for confirmation from all called sites. All called sites must confirm a working channel has been assigned before the timer expires; if not, the console operator will be given a grant tone when the timer expires, signaling the transmission may proceed in a non-confirmed state. The valid time delay range is 0 - 10 seconds, select desired value from the drop-down list box.

Audio Indicators

Mute Volume
This is the volume used at a muted console module when an incoming call is received. Some dispatchers may want zero volume when they mute a module and others may want just a lower volume than the previous volume. Select the desired volume setting (0 - 32) from the drop-down list box.

Mute All Delay
The time, in seconds, the modules are muted after the MUTE ALL button is pressed. After the delay expires, volumes will return to original levels. Select the desired value (0 - 120) from the drop-down list box.

Default Unselect Speaker
This is the unselect speaker number for unprogrammed or non-monitored incoming calls. Valid options are speakers 2 through 4, speaker 1 is for select calls. Select the desired speaker from the drop-down list box.

Default Module Volume
This is the default volume setting on the unselect speaker (selected above) for incoming calls. Use the drop-down list box to select a value from 0 thru 32.

NOTE

For C3 Maestro for Windows NT the volume settings are 0 - 10, however, the actual volume range is the same.

Tone Attenuation
Console tone volume levels are determined by subtracting this setting (dBm) from the volume of the current console module associated with the tone. For example, if the level is set to "5," the tones will be 5 dBm less than the voice audio at the current module. Select a dBm level between 0 and 40 from the drop-down list box. Setting the offset number to a large value (near 40) will effectively turn off the tones at the console. Headsets equipped with AGC circuits may defeat this feature.

Error Tones
Select this check box to enable the error tone when the console determines an error has occurred. Unselect to disable the error tone.

Force Tones to Select Speaker
Select this check box to force confirmation tones and error tones to the select speaker. Unselect to disable.

Audible Trunked/Failsoft Tones
This option is available only if the Trunked/Failsoft Display check box in the Visual Indicators group is selected. Select this check box to enable an audible warning tone when a trunked site goes to Failsoft mode. Unselect to disable the audible warning tone (the visual warning will still appear).

Emergency Indicators

Alarm Reset Required Before Emer Clear
Select this check box to force the dispatcher to reset the emergency alarm before clearing the emergency itself. Unselect to disable this function.

Emergency Clear Silences Alarm
Select this check box to enable the EMERGENCY tone to be silenced when the EMERGENCY is cleared by anyone. Unselect to disable, the tone will remain until cleared by dispatcher.

Minimum Alarm Volume
This is the minimum level at which an emergency tone will be heard. The greater of the module volume or this volume will be used for the emergency tone level. Select this value (0 - 32) from the drop-down list box.

Auto Programmed Alarm Volume
This is the volume setting for incoming non-monitored emergency calls. Select this value (0 - 32) from the drop-down list box.

Table 4 Console Individual Call Levels

INDIVIDUAL CALL PRIVILEGE	CEC/IMC MANAGER CONFIGURATION	CONSOLE EFFECT
disabled (no Individual Call privileges)	all units must be removed from the console's privilege list (See Section 3.11.4)	a dispatcher cannot make or monitor any Individual Call
partial	desired units are enabled in the console's privilege list and the "Monitor ICALL Privilege" is disabled (check box unselected)	a dispatcher can make Individual Calls to units on the privilege list but cannot monitor any Individual Call
full (Supervisor console set-ups only)	desired units are enabled in the console's privilege list and the "Monitor ICALL Privilege" is enabled (check box selected)	a dispatcher can make Individual Calls to any unit and can monitor any Individual Call

Save and Send Console User Profile Configurations

When the console user profile configuration is complete, save (write) the new configuration to the CEC/IMC Manager hard disk. Failure to perform this function may result in loss of the configuration database for this console. The user profile configurations must be sent to the respective console before they will take effect. These actions are

performed from the Console User Profile Configuration dialog box. It is important to save the new configuration to the CEC/IMC Manager hard disk prior to sending it to the CEC/IMC because a send will send the last configuration that was saved to disk. However, if after making changes, a send is performed prior to a save, the CEC/IMC Manager will automatically save the new configuration to disk; this ensures that the actual CEC/IMC configuration will be the same as the displayed settings upon re-entering the Console User Profile Configuration dialog box.

Save

Choose the **Save** button to perform an immediate save of the currently selected console's configuration. Other consoles displayed in the list box located at the top of the dialog box are not saved. The console configuration is saved on the CEC/IMC Manager's hard disk drive. Any previous configuration for the console, if present, is erased and replaced with the current configuration. If the CEC/IMC Manager is running remotely or as a part of the EDACS Network Manager, this configuration is saved on the CEC/IMC Manager local to the CEC/IMC; it is not saved at the remote location.

Save As...

NOTE

Using the **Save As…** function across different console types is **not** recommended.

Choose the **Save As…** button to allow the currently selected console configurations to be saved as a different console. It is provided to speed configurations when similar console configurations are required. Upon choosing **Save As…** a small dialog box will appear which allows selection of a new console number. Select the desired console number from the choices in the drop-down list box. Like **Save**, **Save As…** stores console configuration on the CEC/IMC Manager server.

Send

Choose the **Send** button to send the console configuration data to the respective console and, as discussed previously, if **Send** is performed prior to **Save** the new configuration is automatically saved to the CEC/IMC Manager hard disk before it is sent to the CEC/IMC. This

procedure must be performed before the console will operate with the new configuration.

Close

Choose the **Close** button to exit the Console User Profile Configuration dialog box and return to the CEC/IMC Manager main window. If any changes have been made and not saved, you will be prompted (Write Changes to Disk?) to save and exit (**Yes**), exit without saving (**No**), or cancel the **Close** command and remain in the dialog box (**Cancel**).

3.11.3 C3 Maestro Console Hardware Configuration

Some console parameters are not shift dependent, for the C3 Maestro Console these parameters are configured from the C3 Maestro Hardware Configuration dialog box, Figure 28. From the CEC/IMC Manager menu bar select Configure System / Console Configuration / Hardware to display the C3 Maestro Hardware Configuration dialog box.

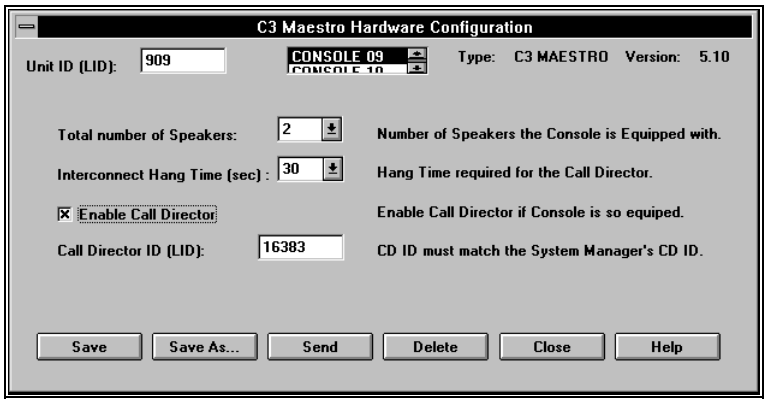


Figure 28 C3 Maestro Hardware Configuration Dialog Box

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

Select the console to configure from the list box in the top center of the dialog box. The unit ID (LID) for the selected console will be displayed in the text box in the upper left corner and the console type

and its software version will be displayed in the upper right corner of the dialog box.

Total Number of Speakers
Select the number of speakers that the selected console is equipped with from the drop-down list box. Most consoles have two speakers, the *select* speaker and the *unselect* speaker.

Interconnect Hang Time
This is the hang-time required for the Call Director. Select this value from the drop-down list box, it should be set to 30 seconds (the default value).

Enable Call Director
Select this check box to enable Call Director if console is so equipped. If enabled, the Total Number of Speakers should be no more than three.

Call Director ID
This text box displays the Call Director ID (LID), it must match the System Manager's Call Director ID for this console.

Delete

Choose the **Delete** button to remove ("delete") a C3 Maestro console hardware database from the CEC/IMC Manager hard disk. If the console is no longer used or the console never existed the database should be deleted. A Message Box will be displayed asking you to confirm (**OK**) or cancel (**Cancel**) the **Delete** command.

Save and Send C3 Maestro Console Hardware Configurations

After reconfiguring the C3 Maestro console the new configuration needs to be saved and sent to the console before the new configurations will take effect. These actions are performed from the C3 Maestro Hardware Configuration dialog box. If after making changes, a send is performed but a save is not, the actual console operation will differ from the displayed settings upon re-entering the C3 Maestro Hardware Configuration dialog box.

Save

Choose the **Save** button to perform an immediate save of the currently selected console's configuration. Other consoles displayed in the list box located at the top of the dialog box are not saved. The console configuration is saved on the CEC/IMC Manager's hard disk drive. Any previous configuration for the console, if present, is erased and

replaced with the current configuration. If the CEC/IMC Manager is running remotely or as a part of the EDACS Network Manager, this configuration is saved on the CEC/IMC Manager server, typically local to the CEC/IMC; it is not saved at the remote location.

Choose the **Save As…** button to allow the currently selected console configurations to be saved as a different console. It is provided to speed configurations when similar console configurations are required. Upon choosing **Save As…** a small dialog box will appear which allows entry of a new console number. Do not type a number in the Save As drop-down list box, the console number must be selected from a number in the drop-down list. Like **Save**, **Save As…** stores console configuration on the CEC/IMC Manager server.

Choose the **Close** button to exit the C3 Maestro Hardware Configuration dialog box and return to the CEC/IMC Manager main window. If any changes have been made and not saved, you will be prompted (Write Changes to Disk?) to save and exit (**Yes**), exit without saving (**No**), or cancel the **Close** command and remain in the dialog box (**Cancel**).

Digital Console Pre-empt

Digital console pre-empt allows for console pre-empting of digital calls. This feature may require Site Controller or GETC interface and radio software changes, refer to the compatibility matrix in Release Notes 350A1874 for specific information. This feature should be disabled from the CEC/IMC Manager and left in the disabled state. From the CEC/IMC Manager menu bar select Configure System / System Options / Digital Console Pre-empt to display the System Options dialog box. The Digital Console Pre-empt check box should be unselected (unchecked) to disable this feature. Select the check box to enable Digital Console Pre-empt if desired and supported.

3.11.4 Console Privilege Lists

Each console has a privilege list that defines its specific privileges. From this list, a CEC/IMC Manager user can grant or deny a console access to specific units, groups, and conventional channels. For example, a non-supervisory C3 Maestro console which is denied access to a group will not be able to add the group to a module. This function

is used to define the units, groups, and conventional channels that the console is allowed to program.

CAUTION

Currently dedicated SAID entries are shown in the Group list. These entries **should not** be privileged for any console. It is recommended that these entries are given a name in the form SAIDXXXX.

Before privilege lists can be defined System Manager unit and group uploads must be complete (there would be no database to define from otherwise). See Transfer From System Manager, Section 3.6.1, on page 3-17 if this has not been previously completed.

NOTE

At this point in the set up process conventional channels cannot be added to the privilege list for a console because they have not yet been defined/programmed. Conventional channels are programmed in CONVENTIONAL CHANNEL CONFIGURATION on page 3-148. They can only be added to the privilege lists and console modules after they are programmed.

Privilege lists are defined in the Console Privilege List dialog box, Figure 29. From the CEC/IMC Manager menu bar select Configure System / Console Configuration / Privilege List to display the Console Privilege List dialog box. Three list boxes of available entities are displayed: Group ID, Unit ID, and Conventional ID, an asterisk at the right of an entry indicates the entity is enabled for programming.

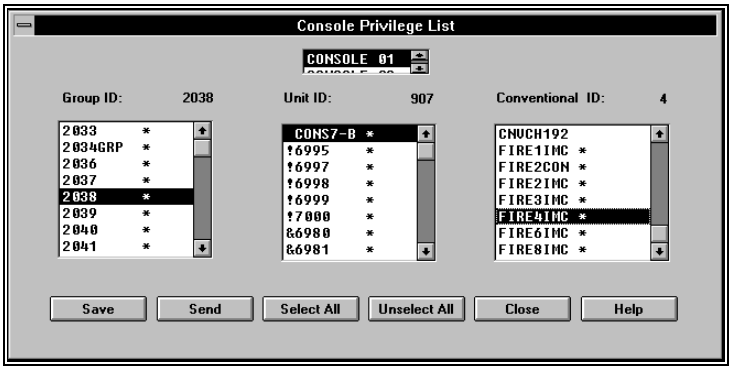


Figure 29 Console Privilege List Dialog Box

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

Configure Privilege Lists

Although only Unit privilege list definition is discussed in the following paragraph, Group and Conventional privileges are defined the same way as Unit privileges.

Select the console to define privilege list for from the list box in the top center of the dialog box. To define the unit privilege list database for the selected console select the desired unit from the Unit ID list box using the selection cursor, the unit ID of the selected unit will be displayed opposite Unit ID above this list box. Press **Enter** to change the selected unit to the opposite status, i.e. a programmable unit will now be not programmable, and vice-versa; double-clicking the unit will also toggle it to the opposite status. The entire unit database may be scrolled through to determine which are programmable and which are not. To reprogram a large number of units see the following discussion for the **Unselect All** and **Select All** buttons. Different consoles may have different privilege lists.

Unselect All

Choose the **Unselect All** button to disable all units from being programmed. All the asterisks on the right should disappear. This function is handy when only a limited number of units will be allowed to be programmed. Now only the few units allowed to be programmed must be modified.

Select All

Choose the **Select All** button to enable all units to be programmed. All the asterisks on the right should be displayed. This allows the dispatcher to program any unit. This function is handy when only a few units will not be allowed to be programmed. Now only those units that need to be disabled need to be modified.

Save And Send Console Privilege Lists

When the privilege list configuration is complete, the new configuration must be sent to the console before the new configurations will take effect. It is important to save the new configuration to the CEC/IMC Manager hard disk prior to sending it to the console, this ensures that the actual console configuration is the same as the configuration stored on the CEC/IMC Manager hard disk. If after making changes, a send is performed but a save is not, the actual console operation will differ from the displayed settings upon re-entering the Console Privilege List dialog box. These actions are performed from the Console Privilege List dialog box.

Save

Choose the **Save** button to perform an immediate save of the currently selected console's configuration. Other consoles displayed in the list box located at the top of the dialog box are not saved. The console configuration is saved on the CEC/IMC Manager's hard disk drive. Any previous configuration for the console, if present, is erased and replaced with the current configuration.

Send

Choose the **Send** button to upload the privilege list data to the console. The console will need to be on-line for this function to execute successfully. The entire privilege list will be uploaded to the console. The user at the console will need to log out and log back in again after this operation (In case a non-valid module is already programmed).

Close

Choose the **Close** button to exit the Console Privilege List dialog box and return to the CEC/IMC Manager main window. Any configurations not saved and sent will be lost unless **Save** and **Send** are performed first. If any changes have been made and not saved, you will be prompted (Write Changes to Disk?) to save and exit (**Yes**), exit

without saving (**No**), or cancel the **Close** command and remain in the dialog box (**Cancel**).

3.11.5 C3 Modular/Desktop Console Configuration

A special configuration procedure must be performed to set-up each C3 Modular/Desktop console's Translator. This procedure configures the console's module database stored in the Translator Controller Board. Configurable parameters for each module are module type (trunked or conventional), display type (alphanumeric or fixed), unselect speaker number, and module present (yes or no). Each C3 Modular/Desktop console can be equipped with up to sixty-four total modules.

C3 Modular/Desktop consoles are configured from the C3 Modular/ Desktop Console Configuration dialog box, Figure 30. From the CEC/IMC Manager menu bar select Configure System / Console Configuration / C3 Desktop to display the C3 Modular/Desktop Console Configuration dialog box.

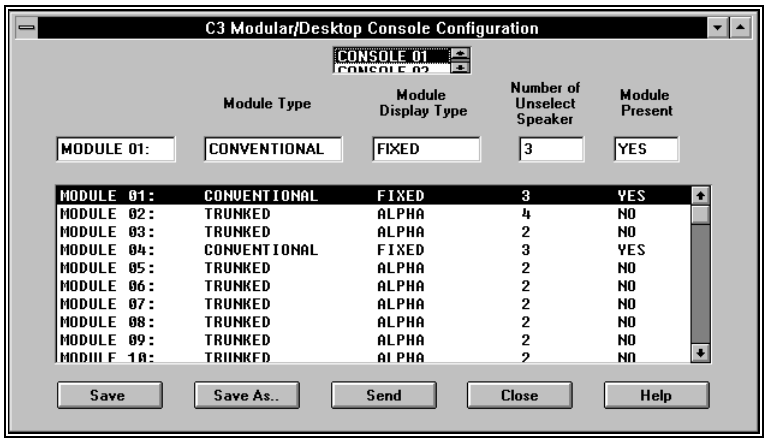


Figure 30 C3 Modular/Desktop Console Configuration Dialog Box

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

Configure Communication Modules

Select the console to configure from the list box at the top center of the dialog box. Select a module from the list box in the center of the dialog

box, the selected module and its parameters will be displayed in the text boxes above this list box. Change any or all of the parameters as required.

Module Type
The Module Type may be either TRUNKED or CONVENTIONAL. TRUNKED means that a trunked unit or group may be programmed into that module. CONVENTIONAL means that a conventional channel may be programmed into that module. Press the **Enter** (or **Tab**) key once to highlight the Module text box (read only), press the **Enter** (or **Tab**) key again to highlight the Module Type text box. Enter (type) "c" for CONVENTIONAL or "t" for TRUNKED and press **Enter** (or **Tab**) to complete the entry and move to (highlight) the Module Display Type text box.

NOTE

All of the text boxes can be selected using the selection cursor, however, use of the Enter or Tab keys may be faster and more convenient.

Module Display Type
The Module Display Type may be either ALPHANUMERIC (ALPHA) or FIXED. ALPHA means that the module has an alphanumeric programmable display. FIXED means that the module has a fixed display (non-programmable). Press the **Enter** (or **Tab**) key three times if Module Type was not edited or press **Enter** (or **Tab**) once from the Module Type text box to highlight the Module Display Type text box. Enter (type) "a" for ALPHANUMERIC (ALPHA) or "f" for FIXED and press **Enter** (or **Tab**) to complete the entry and move to (highlight) the Number of Unselect Speaker text box.

Number of Unselect Speaker
The unselect speaker is the speaker for the non-selected modules. Most consoles have 4 speakers with speaker 1 is reserved as the Select speaker, select between speakers 2 - 4 as the Unselect speaker by pressing the **Enter** (or **Tab**) key until this text box is highlighted. Enter the number of the unselect speaker (2 - 4) and press **Enter** (or **Tab**) to move to the Module Present text box.

Module Present
The Module Present indicates whether the module actually exists. Each C3 Modular/Desktop console can support up to 64 modules, but the Module Present should only have a YES for those modules actually present. Select this text box using either the **Enter** (or **Tab**) key or selection cursor and enter "y" for YES or "n" for NO. Selecting another module or text box will complete the entry.

Save And Send C3 Modular/Desktop Console Configurations

After reconfiguring the C3 Modular/Desktop Console the new configuration needs to be saved and sent to the console before the new configurations will take effect. These actions are performed from the C3 Modular/Desktop Console Configuration dialog box. If after making changes, a send is performed but a save is not, the actual console operation will differ from the displayed settings upon re-entering the C3 Modular/Desktop Console Configuration dialog box.

Save

Choose the **Save** button to perform an immediate save of the currently selected console's configuration. Other consoles displayed in the list box located at the top of the dialog box are not saved. The console configuration is saved on the CEC/IMC Manager's hard disk drive. Any previous configuration for the console, if present, is erased and replaced with the current configuration. If the CEC/IMC Manager is running remotely or as a part of the EDACS Network Manager, this configuration is saved on the CEC/IMC Manager server, typically local to the CEC/IMC; it is not saved at the remote location.

Save As...

Choose the **Save As…** button to allow the currently selected console configurations to be saved as a different console. It is provided to speed configurations when similar console configurations are required. Upon choosing **Save As…** a small dialog box will appear which allows entry of a new console number. Do not type a number in the Save As drop-down list box, the console number must be selected from a number in the drop-down list. Like **Save**, **Save As…** stores console configuration on the CEC/IMC Manager server.

Send

Choose the **Send** button to download the C3 Modular/Desktop console configuration to the console translator. The translator databases this

configuration information in NOVRAM and will not require another download unless the configuration changes.

Close

Choose the **Close** button to exit the C3 Modular/ Desktop Console Configuration dialog box. Any configurations not saved and sent to will be lost unless **Send** and **Save** are performed first. If any changes have been made and not saved, you will be prompted (Write Changes to Disk?) to save and exit (**Yes**), exit without saving (**No**), or cancel the **Close** command and remain in the dialog box (**Cancel**).

3.11.6 View Patch/Simulselect

The View Patch/Simulselect option can be used to view, deactivate and delete ("soft") patches and simulselects made from consoles. This option reads and changes the ("soft") patch/simulselect data stored in the MOM Controller Board. From the CEC/IMC Manager menu bar select Configure System / Console Configuration / View Patch/Simulselect to display the Patch and Simulselect View dialog box, Figure 31. The Patch and Simulselect View dialog box is automatically updated once per second in accordance with the MOM Controller Board's patch/simulselect data.

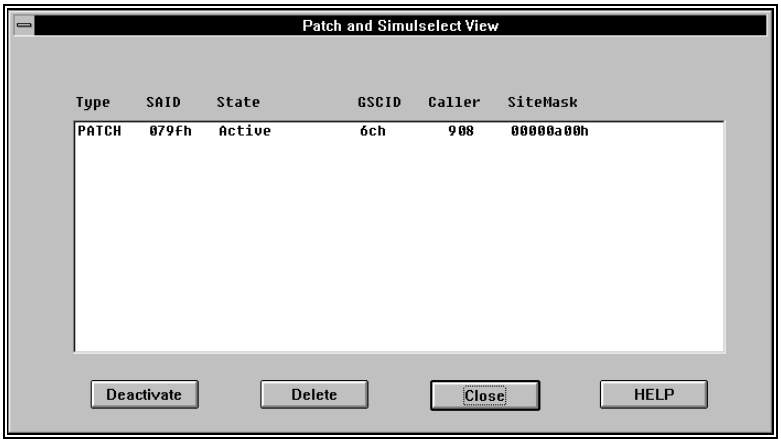


Figure 31 Patch and Simulselect View Dialog Box

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

Type
The type is either PATCH or SIMUL (Simulselect).

SAID
The SAID is the special group ID assigned to a "soft" or console patch or simulselect. This entry is in hex format.

State
Current state of this patch or simulselect in the system. Described below are the each of the possible states that may appear.

- **Requested** – header received, waiting for activate request
- **Req Activate** – activate request received, waiting for first "Active" from any site
- **Active** – one or more "Active" messages received from site(s)
- **Deactivated** – deactivate request received, waiting for first "Inactive" message from any site
- **Inactive** – One or more "Inactive" messages received from site(s), waiting for "Inactive" from all sites that responded initially to this patch/simulselect

GSCID
The GSC ID of the originator of this patch/simulselect

Caller
The Unit ID of the console currently utilizing this patch/simulselect.

Site Mask
The sites currently involved in this patch/simulselect. This is a 32 bit value in hex format, where each bit corresponds to one of the 32 possible sites, i.e. bit 1⇒site 1, bit 2⇒site 2, etc. The rightmost bit is bit 1. If the bit is set, the corresponding site has responded with an "Active" for this patch/simulselect. For example, the value 080E0211 would be in binary format: 0000 1000 0000 1110 0000 0010 0001 0001. Now it is easy to see that the bits 1, 5, 10, 18, 19, 20, 28 are set, indicating that sites 1, 5, 10, 18, 19, 20, and 28 are active in this patch/simulselect.

Deactivate

Choose the **Deactivate** button to deactivate a selected patch/simulselect. The **Deactivate** command is sent just to those sites with the active patch/simulselect. The sites then notify the consoles that the patch/simulselect has been deactivated. This is the preferred method of deactivating a patch/simulselect.

Delete

Choose the **Delete** button to delete a selected patch/simulselect. **Delete** sends a deactivate command to the sites with the active patch/simulselect, and also sends the deactivate (delete) command to the consoles. Patches/simulselects normally should not be deleted or deactivated using the **Delete** button, this should be used only if the patch/simulselect does not respond to the **Deactivate** command.

Close

Choose the **Close** button to exit the Patch and Simulselect View dialog box and return to the CEC/IMC Manager main window.

3.12 DIGITAL VOICE CHANNEL CONFIGURATION

In order to support digital voice console dispatch, the CEC/IMC must be equipped with at least one **D**igital **V**oice **I**nterface **M**odule (**DVIM**). Each DVIM supports up to thirty-two digital voice channels and there may be as many as four (4) DVIMs in the CEC/IMC. This section describes how to configure the available digital voice channels for console digital voice dispatch to suit your system needs. This will

allow the CEC/IMC and associated consoles to process clear voice as well as Aegis™ digital and Aegis encrypted calls. DVIM channels are either pooled (dynamically assigned) or dedicated to a particular group. Each DVIM channel should be programmed for either pooled or dedicated operation. Each utilized digital voice audio channel is connected to a Digital Voice Interface Unit (DVIU). The DVIU operates either in an encryption mode or a decryption mode depending upon the relay control signal received from the DVIM Audio Board.

The lowest assigned DVIM (i.e. DVIM 1) will process all calls until all its DVIUs are busy, whereupon the next assigned DVIM will start processing calls. In order for DVIM 4 to start processing calls, all lower assigned DVIMs (DVIM 1, DVIM 2 and DVIM 3 (96 DVIUs)) must be busy. Each DVIM will balance load it's assigned DVIUs (i.e. DVIU 1 will not be reassigned until all other DVIUs assigned to this DVIM have been assigned).

There is no requirement that DVIMs be assigned in sequential order. In other words, DVIM combinations of: DVIM 1, DVIM 3 and DVIM 4 will work the same as DVIM 1, DVIM 2 and DVIM 3 or DVIM 2, DVIM 3 and DVIM 4. This allows for easier system software upgrades in the future. It is also not required that all 32 DVIUs be configured to DVIM 1 before DVIM 2 can be used. You may configure 16 DVIUs to DVIM 1 and 16 DVIUs to DVIM 2. This will allow for better fault tolerance/hot backup for DVIM controller board failure.

As with other interface modules, each DVIM is assigned a unique site assignment number (1 thru 32) within the CEC/IMC. This number corresponds to and matches the site assignment number set via the 5-bit DIP switch setting on the interface module Controller Board

3.12.1 DVIM Selection

Prior to actual channel configuration, the interface module to be configured must be selected. From the CEC/IMC Manager menu bar select Configure System / CEC/IMC Configuration / DVIM (see Figure 12 on page 3-23) to display the DVIM Channel Configuration List dialog box, Figure 32.

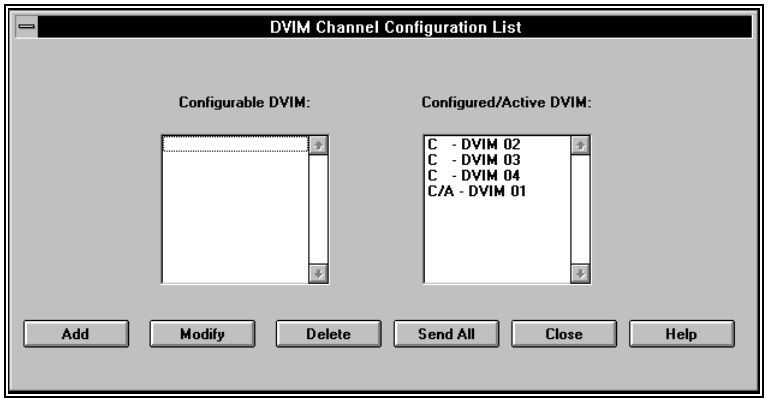


Figure 32 DVIM Channel Configuration List Dialog Box

Each DVIM Channel Configuration List dialog box displays the configurable DVIMs and configured/active DVIMs. An active DVIM represents an operating link between a DVIU and the DVIM Controller Board.

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

Configurable DVIM:
The Configurable DVIM list box displays all unconfigured DVIM interface modules. If a DVIM appears in this box, no channel configuration exists at the CEC/IMC Manager for the corresponding site assignment number and the DVIM may be selected for configuration. Any number of these available DVIM may be selected at one time.

Configured/Active DVIM:
The Configured/Active DVIM list box displays DVIMs which have been added but not yet channel-configured, DVIMs which have had previous channel configurations performed, and DVIMs which have been previously channel-configured and have an active Controller Board. Before a DVIM interface module can be channel-configured, it must be listed in the Configured/Active DVIM list box. As with the Configurable DVIM list, any number of the available DVIMs may be selected at one time. All of the selected DVIMs will also be included in the "**Save As…**" dialog box that is accessed from the DVIM Channel Configuration dialog box. See Table 1,

Configured/Active Sites Prefix Definitions, on page 3-25 for an explanation of the different prefixes if necessary.

Add

Choose the **Add** button to move a selected DVIM from the Configurable DVIM list box and "add" it to the Configured/Active DVIM list box where it can be configured. If upon adding a DVIM, a configuration data file exists on the CEC/IMC Manager's hard disk drive from a previous add and delete, the DVIM will be added with a "C" prefix. This previous configuration may be modified, saved and sent as needed.

Delete

Choose the **Delete** button to remove ("delete") a selected configured or unconfigured DVIM from the Configured/Active DVIM list box to the Configurable DVIM list box. Configured-and-active DVIMs cannot be "deleted." This delete function does not remove DVIM channel configuration files from the CEC/IMC Manager's hard disk drive. If the deleted DVIM is subsequently added back to the Configured/Active DVIM list box using the **Add** button, the previous channel configuration is not lost.

CAUTION

Channels with a dedicated group will not be undedicated in the **Delete** process. Channels should be undedicated (See Dedicated Channels below) before a DVIM is deleted. Failure to undedicate these channels before deleting the DVIM may cause erratic behavior of the CEC/IMC.

Modify

Choose the **Modify** button to display the DVIM Channel Configuration dialog box, which is where channel configuration actually is performed. One or more "sites" must be selected in the Configured/Active Sites list before the DVIM Channel Configuration dialog box will be displayed.

3.12.2 DVIM Configuration

This section describes configurations for channels within DVIMs. The fundamental DVIM channel parameters are permanently set and cannot

be changed at the CEC/IMC. Input and output signal levels are set to 0 dBm, ALC is always disabled, and channel signaling is always off. The remaining channel parameters are configured from the DVIM Channel Configuration dialog box, Figure 33. Only those DVIMs which were selected in the DVIM Channel Configuration List dialog box are available for channel configuration. Select the desired DVIM(s) to configure from the Configured/Active DVIM list, or add the desired DVIM(s) from the Configurable DVIM list, if not already listed. Choose **Modify** to display the DVIM Channel Configuration dialog box. The selected DVIMs are displayed in a list box at the top center of the dialog box.

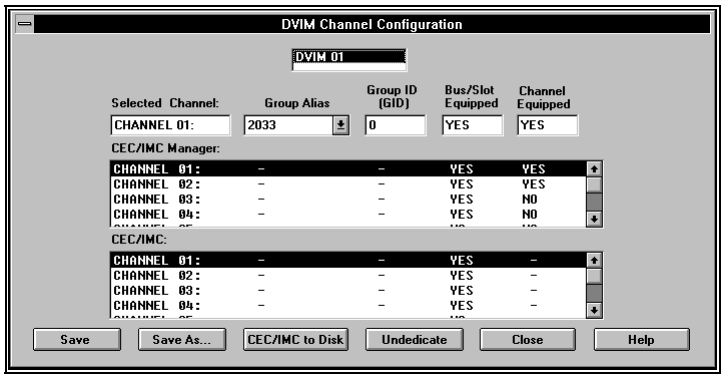


Figure 33 DVIM Channel Configuration Dialog Box

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

View Current CEC/IMC Manager Channel Configuration

The upper list box in the DVIM Channel Configuration dialog box, labeled "CEC/IMC Manager," displays the current channel configurations stored on the CEC/IMC Manager hard disk for the currently selected DVIM. As the edit fields above this list box are modified for a selected channel, the changes will appear also in this list box for the selected channel.

View Current CEC/IMC Channel Configuration

The lower list box in the DVIM Channel Configuration dialog box, labeled "CEC/IMC," displays the current channel configurations stored at the CEC/IMC for the currently selected DVIM. Information within

this box updates only after **Send** is performed from the DVIM Channel Configuration List dialog box.

Channel Selection
Select a channel (1 thru 32) for configuration from the CEC/IMC Manager channel list box, only one channel may be selected at a time. The selected channel and its configuration data will displayed in the edit fields above the CEC/IMC Manager list box.

Group Alias
This is the alias associated with the group dedicated to this channel. Select from the drop-down list box. The Channel Equipped field must be set to "Y" to dedicate the channel. A channel that doesn't have an alias and whose Channel Equipped field is marked "Y" is designated as dynamic and can be used to route digital voice calls for groups that are not dedicated to other channels.

Group ID (GID)
This is the Group ID for the Group that was dedicated to the selected channel in the Group Alias field.

Channel Equipped
A "Y" in this field indicates that the audio channel is connected to a DVIU and can encrypt or decrypt audio. Enter "Y" in this text box to enable the channel for digital voice communications (dedicated or dynamic), enter "N" for unused channels.

Bus/Slot Equipped
Each channel supported by the DVIM requires one bus slot. The ideal configuration would be one slot (channel) per Aegis group, however, this is not a requirement. The DVIM will support both dynamic and dedicated channel allocations. Enter "Y" in the text box to allocate a bus slot, enter "N" for unconfigured channels.

CEC/IMC to Disk

Choose the **CEC/IMC to Disk** button to transfer the DVIM configuration stored on the DVIM Controller Board at the CEC/IMC to the CEC/IMC Manager hard disk. If the CEC/IMC Manager hard disk database was lost or reset to undesired values, the **CEC/IMC to Disk** command would restore the CEC/IMC Manager database to that of the DVIM Controller Board.

Dynamic Channels

In this mode of operation, the DVIM processes Aegis calls that are not assigned to dedicated channels. The DVIM assigns the call to the first available non-dedicated channel. The only limitation with this mode of operation is all dynamic channels must have the same DVIU key.

To configure a dynamic channel, change the channel equipped field for that channel to a "Y" (this channel must be connected to a DVIU). Leave the Group Alias and Group ID fields blank when the channel equipped field is set to "Y" to indicate it is for dynamic allocation.

Dedicated Channels

Dedicated channels will always process calls assigned to that channel. This allows DVIUs to be dedicated to Aegis groups. Therefore, a system, agency, fleet or group call may be assigned a dedicated DVIM channel, each of which may have a different DVIU cryptographic key. For example, an agency may be assigned to channel 1 of the DVIM and a group within that agency may be assigned to channel 2 of the DVIM. The agency calls will be encrypted/decrypted by the DVIU connected to channel 1 of the DVIM and the group calls will be encrypted/decrypted by the DVIU connected to channel 2. The 2 DVIUs may have different cryptographic keys.

To dedicate a DVIM channel, set the Channel Equipped field to "Y" and select the desired group from the Group Alias drop-down list box. A warning message will be displayed if the group is already dedicated to a DVIM channel.

Choose the **Undedicate** button to undedicate a channel. The channel (if previously equipped) will become dynamic and the Group Alias and Group ID fields will become blank.

Save and Send DVIM Configurations

When the channels are configured, the configuration must be sent to the DVIMs. Each DVIM stores the database in its Non-Volatile RAM (NOVRAM) so it will remain present after resets. The data does not have to be uploaded again unless the configuration is changed or the NOVRAM is reset on the DVIM. Action in both the DVIM Channel Configuration dialog box and the

DVIM Channel Configuration List dialog box is required to save and send DVIM configurations.

DVIM Channel Configuration dialog box

Save

Choose the **Save** button to perform an immediate save of the currently selected DVIM channel configuration. Other DVIMs displayed in the list box located at the top of the dialog box are not saved. The channel configuration is saved on the CEC/IMC Manager's hard disk drive. Any previous channel configuration for the DVIM, if present, is erased and replaced with the current channel configuration. If the CEC/IMC Manager is running remotely or as a part of the EDACS Network Manager, this configuration is saved on the CEC/IMC Manager local to the CEC/IMC; it is not saved at the remote location.

Save As...

Choose the **Save As…** button to allow the currently selected DVIM channel configurations to be saved as a different DVIM. It is provided to speed configurations when similar configurations are required. Upon choosing **Save As…** a small dialog box will appear which allows entry of a new DVIM number. Do not type a number in the Save As drop-down list box, the DVIM number must be selected from a number in the drop-down list, the choices displayed are the selected DVIMs in the Configured/Active Sites list box. Like **Save**, **Save As…** stores channel configuration on the CEC/IMC Manager server.

Close

Choose the **Close** button to exit the DVIM Channel Configuration dialog box and return to the DVIM Channel Configuration List dialog box. If any changes have been made and not saved, you will be prompted (Write Changes to Disk?) to save and exit (**Yes**), exit without saving (**No**), or cancel the **Close** command and remain in the dialog box (**Cancel**).

DVIM Channel Configuration List dialog box:

Send

Choose the **Send** button to send the channel configuration data to the respective DVIM interface module. This procedure must be performed before the DVIM will operate with the new configuration. Only configured and configured-and-active (C and C/A prefixes) configurations may be sent. All configuration data is sent to the MOM

Controller Board; the Audio configuration is sent directly out from there to the respective interface module Controller Board. A "Send to Site Successful" message will be received to confirm that the data was received by the interface module Controller Board. Bus Slot configuration data is compared to the current configuration at the CEC/IMC Manager; if different, it is sent to the MOM Controller Board (if not, no further action is taken by the system) and when the MOM Controller Board receives this new data it will send an acknowledgment message back to the CEC/IMC Manager, which will then display the confirmation box: "Do you want to activate TDM Bus Slots? OK - will cause all CTRL boards to reset." Choose **OK** to activate TDM Bus Slots (resetting Controller Boards) with the new Bus Slot configuration data, choose **Cancel** to not activate TDM Bus Slots with the new Bus Slot configuration data (keeping the previous configuration) and return to the DVIM Channel Configuration List dialog box.

Choose the **Close** button to exit the DVIM Channel Configuration List dialog box and return to the CEC/IMC Manager main window. Any "**" prefixed DVIMs appearing in the Configured/Active DVIM list box will be removed and returned to the Configurable DVIM list box.

3.12.3 Digital Causeway (Causeway Default to Digital)

If a group is involved in a causeway patch/simulselect with a conventional channel, the group will need to be programmed at a console or logging recorder for proper operation. If the group is not programmed, the trunked radio PTTs will not be decoded/decrypted by the DVIM/DVIU interface.

The Digital Causeway feature is established using the System Options dialog box. From the CEC/IMC Manager menu bar select Configure System / System Options / Digital Causeway, and the System Options dialog box will be displayed.

Select the Causeway Default to Digital check box to enable the Digital Causeway feature, unselect the Causeway Default to Digital check box to disable Digital Causeway.

3.13 DISTRIBUTED MULTISITE / STARGATE CONFIGURATION

A common or central network switch known as a "StarGate Controller" has three or more switches linked to it via NIMs. Users select network operation on a wide area fleet/group basis at the System Manager. Each NIM is assigned a unique site assignment number (1 thru 32) within the CEC/IMC. This number corresponds to and matches the site assignment number set via the 5-bit DIP switch setting on the interface module's Controller Board. There are three steps that must be completed to correctly configure StarGate operation:

1. Unit/Group databases set-up for Multinode operation and downloaded from System Manager
2. NIM TDM bus/slots and channels equipped
3. StarGate configuration as described in the following paragraphs.

StarGate Configuration
StarGate Configuration allows the user to configure group call console tracking, remote CEC interface operation, and NIM control data link baud rates for the network. These parameters are all set on a per NIM basis.

The CEC/IMC ID ("switch assignment number") must be set at the MOM Controller Board before distributed multisite communications will operate correctly. The CEC/IMC firmware will automatically display a CEC/IMC ID number even if one is not set at the MOM; therefore, a displayed CEC/IMC ID does not guarantee that the number has been set. Ensure that this switch assignment number has been set using the DIP switches on the MOM Controller Board as specified in the Distributed Multisite/StarGate Configuration section of LBI-38938, *CEC/IMC Digital Audio Switch Installation, Set-up, and Troubleshooting*.

StarGate configuration is accomplished from the StarGate / Remote CEC / NIM Configuration dialog box, Figure 34. From the CEC/IMC Manager menu bar select Configure System / System Options / StarGate to display the StarGate / Remote CEC / NIM Configuration dialog box.

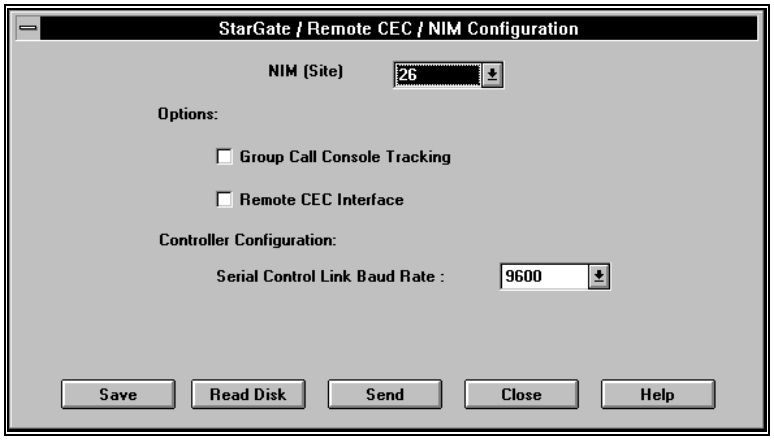


Figure 34 StarGate / Remote CEC / NIM Configuration Dialog Box

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

Options and Controller Configuration

Group call console tracking, remote CEC interface operation, and NIM baud rates for the network are set on a per NIM basis. Select a NIM for configuration from the drop-down list box at the top center of the StarGate / Remote CEC /NIM Configuration dialog box, only those NIMs with an active site link will be included in this list box. When a NIM from this list is selected, a notify box "Read from disk was successful" will appear.

Read Disk

Choose the **Read Disk** button to enter the configuration for the selected NIM currently stored on the CEC/IMC Manager hard disk. The dialog box will update to show this configuration. The user now has the option of using this configuration or entering a new configuration.

Group Call Console Tracking

When this function is enabled the selected NIM will send out group calls whenever they are programmed into a communication module at a remote console. Select this check box to enable, the default is enabled.

This option should only be disabled (unselected) in special circumstances in which routing all calls would cause excessive NIM traffic. In general, StarGate/NIM networks which require large amounts of console dispatch operations will require enabling of this option.

Remote CEC Interface
This function allows all call traffic being monitored by a console or logging recorder on a remote CEC system to be routed by the NIM link. This option must be enabled at both NIMs in the link. The default is disabled (check box unselected) and it should only be enabled (selected) for remote CEC (console only node) links.

Serial Control Link Baud Rate
This drop-down list box allows setting of the NIM control data link baud rate. This link is the control data connection between Network Interface Modules (NIM) coupling two CEC/IMC or StarGate Digital Audio Switches together. The NIM on each end of the link must be manually set to equal baud rates via this field. Select the required value from the available baud rates of 9600, 19.2k, and 38.4k.

Save and Send StarGate Configurations

When the StarGate configurations for all the NIMs have been completed, they must be saved and then sent across the multisite network.

Choose the **Save** button to perform an immediate save of the currently selected NIM configuration. Other NIMs displayed in the list box located at the top of the dialog box are not saved. The configuration is saved on the CEC/IMC Manager's hard disk drive. Any previous StarGate configuration for the NIM, if present, is erased and replaced with the current configuration. If the CEC/IMC Manager is running remotely or as a part of the EDACS Network Manager, this configuration is saved on the CEC/IMC Manager local to the CEC/IMC; it is not saved at the remote location.

Choose the **Send** button to send the NIM configuration across the IMC network. This procedure must be performed before the NIM will operate with the new configuration.

Close

Choose the **Close** button to exit this dialog box and return to the CEC/IMC Manager main window. If any changes have been made and not saved, you will be prompted (Write Changes to Disk?) to save and exit (**Yes**), exit without saving (**No**), or cancel the **Close** command and remain in the dialog box (**Cancel**).

NIM Link-Up Verification

The NIM control links between IMCs can now be verified if desired. Monitor the control link state by viewing the NIM STATISTICS screen and observing that the Link State is UP. To access the NIM STATISTICS screen, select Monitor System from the CEC/IMC Manager menu bar, then select Statistics from the Monitor System menu. Select NIM from the Statistics menu to display the Active Devices dialog box, select the desired NIM and choose **OK**. The Link State is displayed in the lower left corner of the NIM STATISTICS screen, choose **Close** to exit return to the Active Devices dialog box. Choose **Close** in the Active Devices dialog box to return to the CEC/IMC Manager main window. For more a detailed description of monitoring NIM performance see NIM Statistics on page 4-24.

3.14 CONVENTIONAL CHANNEL CONFIGURATION

The VMIM interface module and CIA secondary interface rack couple conventional tone or DC controlled base stations and conventional voting systems to the CEC/IMC switch. Each VMIM/CIA set can provide thirty-two CEC/IMC conventional channel interfaces, and a CEC/IMC may be equipped with two VMIM/CIA sets, providing up to sixty-four conventional channel interfaces per CEC/IMC.

The CIA rack is considered a secondary CEC/IMC interface module since is not a part of the primary CEC/IMC backplane structure. Each CIA rack is connected to a VMIM by 4-wire audio links (one per channel) between the VMIM Audio Boards and the CIA rack CI Boards, and a single full-duplex serial control data link between the VMIM Controller Board and the CCI Controller Board. The CIA appears to a VMIM as an EDACS trunked site with one or more units logged on. Each unit represents a conventional channel with System Manager LID database programming and/or CEC/IMC Manager conventional channel programming.

Required conventional channel configurations at the CEC/IMC Manager include both VMIM-related channel configurations and Conventional Interface Adapter (CIA) rack-related channel configurations. This section primarily describes configurations which effect the main components of a CIA rack—the Conventional Control Interface (CCI) Board and the Conventional Interface (CI) Boards.

As described in the following section (StarGate Network Conventional Channels) a StarGate network supports 255 conventional channels by spreading VMIM/CIA conventional interface sets across multiple CECs and/or IMCs in the StarGate network. For those CEC/IMCs which are not part of a StarGate network the following section may be skipped over for now, and Conventional Channel Configuration continued with Section 3.8.4, VMIM Channel Configuration, on page 3-82 followed by Conventional Channel Configuration, Section 3.14.3 on page 3-155.

3.14.1 StarGate Network Conventional Channels

A StarGate network will support up to 255 conventional channels spread out over several CEC/IMCs. For example, in a StarGate network four (4) CEC/IMCs may each contain 64 conventional channels (max per CEC/IMC, 256 ÷ 64 = 4, with one less conventional

channel at one CEC/IMC), or eight (8) CEC/IMCs in a StarGate network may each contain up to a maximum of thirty-two (32) conventional channels. In both of the preceding examples the highest conventional channel in this configuration would actually be 256; however, channel 256 cannot be used due to CEC/IMC call message formats. The StarGate conventional channel configuration can be spread over more CEC/IMCs by limiting the maximum number of conventional channels per CEC/IMC. The maximum number of conventional channels per CEC/IMC must be specified when installing Enhanced StarGate (V4.0 or later) software. **In a StarGate network, the maximum number of conventional channels at each CEC/IMC must be equal**, i.e. all 64 or all 32 or all 16, etc. The allocation process is described in Conventional Channel Allocation.

Conventional Channel Allocation

Each CEC/IMC in a StarGate network is assigned fixed conventional channel allocation numbers based on the maximum number of conventional channels allowed per CEC/IMC and the CEC/IMC "switch assignment number" (sometimes referred to as "node number", "node assignment number" or "device ID"). Both of these parameters must be specified when installing the CEC/IMC Manager software. This is accomplished using an off-line program, UF_CONV.EXE, which is included with the CEC/IMC Manager software package. If UF_CONV.EXE is not executed, the maximum conventional channels per CEC/IMC defaults to 64.

NOTE

UF_CONV.EXE must be executed if upgrading CEC/IMC Manager software from V3.0 (or earlier). See Software Release Notes SRN-1000 for details.

When the UF_CONV.EXE program is executed, it prompts the user for the maximum number of conventional channels allowed per CEC/IMC (default = 64) and the CEC/IMC switch assignment number (default = 33). It then converts all existing conventional channel allocation numbers (1 – 64) to new numbers based upon the user-entered values. As stated previously, the maximum number of conventional channels must be equal at all CEC/IMCs in a StarGate network. Also, the CEC/IMC switch assignment number set via UF_CONV.EXE must

match the switch assignment number set by the DIP switches on the MOM Controller Board. See *CEC/IMC Digital Audio Switch Installation, Set-Up And Troubleshooting* (LBI-38938) for MOM Controller Board DIP switch configuration details.

Table 5 maps the conventional channel allocation numbers in a StarGate network when the maximum number of conventional channels per CEC/IMC is set to sixty-four (64). Table 6 shows the mapping for thirty-two (32) maximum channels per CEC/IMC. As shown in these tables, the conventional channel allocations recycle with higher switch assignment numbers. Therefore, when assigning switch assignment numbers, ensure the conventional channel allocations are unique at each CEC/IMC. For example, conventional channels should not be installed at CEC/IMC 33 and CEC/IMC 37 if the maximum number of conventional channels per CEC/IMC is equal to sixty-four (64). Similarly, conventional channels should not be installed at CEC/IMC 33 and CEC/IMC 41 if the maximum number of conventional channels per CEC/IMC is equal to thirty-two (32).

Table 5 Switch Assignment Number-to-Conventional Channel Allocation Mapping for StarGate Networks (Max. Conv. Channels per CEC/IMC = 64)

CEC/IMC SWITCH ASSIGNMENT NUMBERS	CONVENTIONAL CHANNEL ALLOCATIONS
33, 37, 41, 45, 49, 53, 57, 61	1 – 64
34, 38, 42, 46, 50, 54, 58, 62	65 – 128
35, 39, 43, 47, 51, 55, 59, 63	129 – 192
36, 40, 44, 48, 52, 56, 60, 64	193 – 255

Table 6 Switch Assignment Number-to-Conventional Channel Allocation Mapping for StarGate Networks (Max. Conv. Channels per CEC/IMC = 32)

CEC/IMC SWITCH ASSIGNMENT NUMBERS	**CONVENTIONAL CHANNEL ALLOCATIONS**
33, 41, 49, 57	1 – 32
34, 42, 50, 58	33 – 64
35, 43, 51, 59	65 – 96

CEC/IMC SWITCH ASSIGNMENT NUMBERS	CONVENTIONAL CHANNEL ALLOCATIONS
36, 44, 52, 60	97 – 128
37, 45, 53, 61	129 – 160
38, 46, 54, 62	161 – 192
39, 47, 55, 63	193 – 224
40, 48, 56, 64	225 – 255

Conventional Channel Programming

In a StarGate network, conventional channels for each CEC/IMC must be programmed/configured at the respective CEC/IMC Manager. For example, channels 1 thru 32 must be programmed at the CEC/IMC Manager for CEC/IMC 33 (or 41, 49, 57) and channels 225 thru 255 must be programmed at the CEC/IMC Manager for CEC/IMC 40 (or 48, 56, 64). In this example conventional channels 1 thru 32 are "local" to CEC/IMC 33 and all other channels are considered "remote" channels to CEC/IMC 33. Similarly, conventional channels 225 thru 255 are local to CEC/IMC 40 and all other channels are remote channels.

As with a non-StarGate CEC/IMC, conventional channels in a StarGate network are programmed via the CEC/IMC Manager Conventional Channel Configuration dialog box. See Section 3.14.3 for in-depth details.

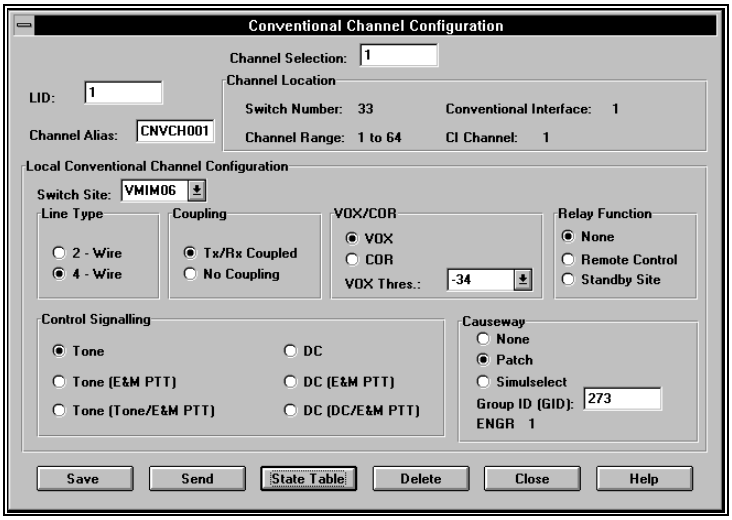


Figure 35 Conventional Channel Configuration Dialog Box

A CEC/IMC Manager can only program/configure its (local) conventional channels. When local conventional channel programming is saved at a CEC/IMC Manager, the channel aliases and channel LIDs of the changed channels are sent to all other CEC/IMCs in the StarGate network. This allows remote conventional channel information to be viewed (read-only function) at all other CEC/IMC Managers in the StarGate network. When viewing remote conventional channel information, displayed read-only information includes the remote channel's CEC/IMC switch assignment number (33 – 64), its LID number, its alias, and the range of conventional channels assigned to the remote CEC/IMC. The switch assignment number and the channel range can be viewed in the Channel Location group of the Conventional Channel Configuration dialog box, Figure 35. The table below, Table 7, breaks out channel locations for 64 channels maximum per CEC/IMC.

In CEC/IMC software/firmware previous to version 4.0, LIDs 1 thru 64 had to be reserved for conventional channels if these channels were going to be patched to trunked groups. In version 4.0 (and later), any free LID can be assigned to a conventional channel. This prevents requiring LIDs 1 thru 255 for conventional channels in a StarGate network.

It is recommended that a conventional channel LID stored in the CEC/IMC Manager be given the same alias as the corresponding conventional channel LID at the System Manager, i.e. **if a System Manager exists, changing a conventional channel alias at the CEC/IMC Manager is possible but not recommended**. This will ease conventional channel identification during patch operations since a console communicates with a conventional channel by its channel number, not its LID number.

NOTE

A console never uses a conventional channel LID. The conventional channel LID is only sent to trunked sites during a conventional channel-to-trunked group patch.

Table 7 Conventional Channel Locations (Example with Max. Conv. Channels per CEC/IMC = 64) (Non-Inclusive Listing)

CEC/IMC SWITCH ASSIGNMENT NUMBER	CIA RACK NUMBER	CIA RACK CHANNEL NUMBER	NETWORK CONV. CHANNEL NUMBER
33	1	1	1
33	1	32	32
33	2	1	33
33	2	32	64
34	1	1	65
34	1	32	96
34	2	1	97
34	2	32	128
35	1	1	129
35	1	32	160
35	2	1	161
35	2	32	192
36	1	1	193
36	1	32	224

CEC/IMC SWITCH ASSIGNMENT NUMBER	CIA RACK NUMBER	CIA RACK CHANNEL NUMBER	NETWORK CONV. CHANNEL NUMBER
36	2	1	225
36	2	31	255*

* Channel 256 is not available.

Remote Conventional Channel Logged Warnings

As previously stated, when conventional channel programming is saved at a CEC/IMC Manager, conventional channel data is sent to all other CEC/IMCs in the StarGate network (the remote CEC/IMCs). When a CEC/IMC receives this remote conventional channel data, it logs one or more "warnings" in its warning datalog file (WARN.DLG). These warnings are part of normal operation and they are logged to provide a record of conventional channel programming activity. All StarGate NIM links and all CEC/IMC Manager (or "StarGate Manager") links must be operational when saving. Refer to APPENDIX B - LOGGED WARNING DEFINITIONS, for logged warning information. Warnings applicable to StarGate network conventional channels include W20-136, W20-137 and W20-138.

Conventional Channel Database

CEC/IMC Manager-Based System Manager Uploads

All conventional channel data (local and remote channels) is sent out to the consoles when a CEC/IMC Manager-based System Manager database upload is performed. See Section 3.6.2, Transfer From CEC/IMC Manager, for details.

Conventional Privilege List

All local and remote conventional channel IDs and Channel Aliases appear in the CEC/IMC Manager's conventional privilege list. At this point there is no difference between local and remote conventional channels to the operator. As conventional channels are configured, they are now "useful" if selected ("privileged") at the console privilege lists. Any conventional channel that should not be available to a console must be unselected ("unprivileged") at that console's privilege list. See Console Privilege Lists on page 3-123 for more details.

Local/Remote Conventional Channel Dispatch
After a console has received the System Manger conventional channel database information and its privilege list, local and remote conventional channel communications operate almost identically. The console operator can program the channel to a communication module, dispatch to the channel, exercise any available conventional channel relay function (local/remote, main/standby, etc.), or patch/simulselect the channel to other conventional channels or trunked groups.

To a dispatcher, the only operational difference between local and remote conventional channels is a call to a remote conventional channel could be queued at the NIM if all NIM channels are currently busy. In this case, similar to when a trunked group call is queued, a "Queued at NIM Site" call status is displayed at the console.

3.14.2 Causeway Patch / Simulselect

Direct conventional channel patching and simulselecting is provided by the Causeway patch and Causeway simulselect features. These features allow direct patching/simulselecting of a conventional channel to a trunked talk group. A Causeway patch/simulselect exists only in the CCI and VMIM Controller Boards. The CCI and VMIM use the trunked talk group ID (GID) number for Causeway patch/simulselect communications. All conventional channels within a CEC/IMC Digital Audio Switch (64 maximum) may be Causeway patched/simulselected. Consoles and trunked sites in the CEC/IMC network know nothing about Causeway patches or Causeway simulselects. These features were previously referred to as "hard patch" and "hard simulselect" respectively.

In contrast, traditional patches/simulselects performed at consoles (which may be thought of as "soft" patches/simulselects) each use a special group ID number referred to as a System Assigned ID (SAID) number. SAIDs are transferred throughout the CEC/IMC network. SAIDs are not used for Causeway patches/simulselects. Soft patches/simulselects are only set-up at the consoles, not the CEC/IMC Manager or System Manager.

Causeway patch/simulselect advantages over "soft" (console) patch/simulselect include:

- trunked radios may scan into conventional channel originated calls since the talk group ID (GID) is used
- operation in Site Controller mode and Failsoft mode

- reduced audio delay for a console PTT
- consoles may pre-empt Causeway patches and Causeway simulselects
- patch/simulselect update time is minimized when a trunked radio roams/logs into a new trunked site
- eliminates the single-point-of-failure (MOM Controller Board) experienced with "soft" patches and simulselects
- frees-up patch/simulselects at consoles which were previously used for "soft" patch/simulselect of these GIDs and conventional channels

All Causeway patches and Causeway simulselects are configured from the Conventional Channel Configuration dialog box, Figure 35. Each channel is configurable for either Causeway patch operation, Causeway simulselect operation or no Causeway operation. If either Causeway operation is selected, the GID number to patch/simulselect to must also be entered.

Disabling (undoing) a Causeway patch or a Causeway simulselect after it has been programmed can only be accomplished from the Conventional Channel Configuration dialog box, not a console. To disable Causeway patch or Causeway simulselect operation, enter the Conventional Channel Configuration dialog box, select the appropriate conventional channel, select "None" in the Causeway group, and send the new configuration. Saving the new configuration is done automatically on a send.

Causeway Patch Operation

Causeway patch operation is summarized as follows:

- A conventional site-originated call on a Causeway-patched conventional channel is routed to consoles and trunked sites via the trunked Group ID (GID) assigned to the Causeway patch.
- A trunked site-originated group call is routed to consoles and the Causeway-patched conventional channel via the trunked Group ID (GID) assigned to the Causeway patch.
- A console-originated group call is routed to trunked sites and the Causeway-patched conventional channel via the trunked Group ID (GID) assigned to the Causeway patch.

- A console-originated conventional channel call is routed only to the conventional channel. This is because the consoles know nothing about the Causeway patch stored in the CCI and VMIM. The Logical ID (LID) assigned to the conventional channel handles this call.

Causeway Simulselect Operation

Causeway simulselect operation is summarized as follows:

- A conventional site-originated call on a Causeway-simulselected conventional channel is routed to consoles but not the respective Causeway-simulselected group. Radios monitoring on the conventional channel also hear the call. This operation is identical to "soft"-simulselected conventional channels.
- A trunked site-originated group call is not routed to the respective Causeway-simulselected conventional channel. It is only routed to the other trunked radios and consoles monitoring the group.
- A console-originated group call via a "common" PTT (selected TX key, mic PTT, or footswitch) at the console is routed to trunked sites and the Causeway-simulselected conventional channel via the respective trunked group ID (GID).
- A console-originated group call via an "instant" PTT (instant TX key) at the console is routed to trunked sites only, not to the simulselected conventional channel.
- A console-originated conventional channel call is routed only to the conventional channel. This is because the consoles know nothing about the Causeway simulselect stored in the CCI and VMIM. The logical ID (LID) assigned to the conventional channel handles this call.

3.14.3 Conventional Channel Configuration

NOTE

After all conventional channels have been configured, saved, and sent, a CEC/IMC Manager-based System Manger database transfer of the conventional channel information is recommended. See SYSTEM MANAGER DATABASE UPLOADS on page 3-14 for details. After completing the transfer, privilege lists of consoles which may require access to conventional channels should be updated by adding the required conventional channels to each console's privilege list. Refer to Console Privilege Lists on page 3-123 for details. Console conventional channel communication modules can then be "built" or "modified" as required.

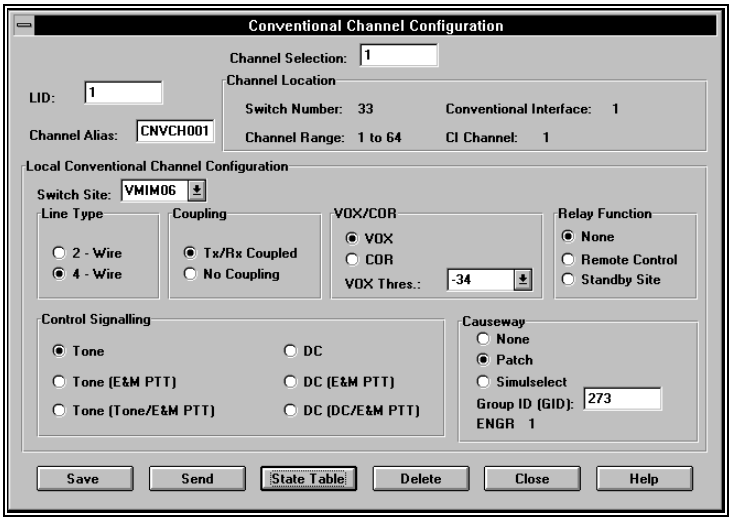
The basic function of the CIA rack is to add, on a per-channel basis, tone or DC control signaling required for remote-controlled conventional base station operation. It also programs each channel's receive signaling for either voice activation (VOX) or carrier activation (COR). Within the CIA rack, these functions are provided by CI Board channels. Unity gain exists for the audio signals routed through a CI Board channel to/from a VMIM Audio Board channel; therefore, no CI Board channel audio signal level adjustments are required since the VMIM provides these level adjustments. Control signaling related level adjustments and other conventional channel-related parameter settings such as 2/4-wire selection are provided by the Conventional Channel Configuration dialog box. As previously stated, settings made from this dialog box effect CCI and CI Board configurations.

Conventional channel parameters are configurable on a per-channel basis. For example, VMIM/CIA 1 channel 1 may be configured to interface to a tone-controlled conventional base station and VMIM/CIA 1 channel 2 may be configured to interface to a DC-controlled conventional base station.

High-Level Configuration

Conventional channel high-level configurations are described in this section. These configurations are performed from the

Conventional Channel Configuration dialog box. Unless otherwise stated, all information applies to both local and remote conventional channels. From the CEC/IMC Manager menu bar select Configure System / CEC/IMC Configuration / VMIM / Conv. Interface Adapter Configuration (see Figure 22) to display the Conventional Channel Configuration dialog box.



Conventional Channel Configuration Dialog Box (same as previous)

NOTE

UF_CONV.EXE must be executed if upgrading CEC/IMC Manager software from V3.0 (or earlier) to V4.0 (or later). See Software Release Notes SRN-1000 for details.

Help

Choose the **Help** command button to access the Help function. (Help is also available by pressing the **F1** key.)

Channel Selection

The Channel Selection text box provides numeric entry for conventional channel selection. It displays the currently selected channel's number. When initially selected, the

Conventional Channel Configuration dialog box displays the first local conventional channel high-level configuration. The displayed configuration is a CEC/IMC Manager-stored configuration, not a CEC/IMC-stored configuration. Channel Selection range = 1 – 255.

To select a different channel, click in the text box, enter (type) the new channel number, and then select elsewhere within the dialog box, or press the **Tab** key to advance to the next text box. The entire dialog box will update per the CEC/IMC Manager-stored conventional channel configuration for the entered channel.

NOTE

CEC/IMC conventional channel configurations are stored in the CCI and CI Boards. CEC/IMC Manager conventional channel configurations are stored on the CEC/IMC Manager hard disk drive. No facility exits to read CEC/IMC conventional channel configurations; therefore, to ensure CEC/IMC and CEC/IMC Manager configurations match for the selected channel, a save and send, or send (automatically saves), of any changes must be performed.

As previously mentioned, upon entering the Conventional Channel Configuration dialog box, the first local conventional channel configuration is displayed and this is usually channel 1. However, in a StarGate network the first local conventional channel could be 1, 65, 129, 193, or 1, 33, 65, 97, etc. in accordance with CEC/IMC switch assignment number and the UF_CONV.EXE program configuration. See StarGate Network Conventional Channels on page 3-145 for additional information.

LID (Logical ID)

Every conventional channel requires a unique (unused) LID number assignment from the System Manager's unit database. The LID text box provides entry for this number for the currently selected channel. LID range = 1 – 16382. Default = currently selected channel number. To enter a LID number, select (or **Tab** to) the text box, type the required LID number, and then select elsewhere within the dialog box or press the **Tab** key again.

NOTE

At the System Manager, all conventional channel LIDs must be programmed with a "Unit Type" equal to "Other."

Channel Alias

This text box displays the alias (name) for the entered LID as defined at the System Manager (if present). It is recommended that a conventional channel's LID stored in the CEC/IMC Manager be given the same alias as the corresponding conventional channel's LID at the System Manager. This Conventional Channel and associated Alias can be found in the Console Privilege Lists, Section 3.11.4, see that section, page 3-123, for more details. In other words, **changing a conventional channel's alias at the CEC/IMC Manager is not recommended if a System Manager exists**. This will ease conventional channel identification during patch operations. A console communicates with a conventional channel by its channel number, not its LID number.

Although not recommended if a System Manager is present in the system, entry of a new alias for a conventional channel is possible. If a System Manager LID database transfer has not occurred or for some other reason this database is not present at the CEC/IMC Manager, a default alias exists and is displayed as defined below. Valid Channel Alias = 8-character (max.) alphanumeric text. Default = "CNVCHxxx" where xxx is channel number.

To enter an alias for the currently selected channel, select (or **Tab** to) the text box, type the alias (8 characters maximum), and then select elsewhere within the dialog box or press the **Tab** key again.

Channel Location

Fields within this group indicate the local/remote information for the currently selected conventional channel. All are read-only:

Switch Number

In most cases, this field displays the CEC/IMC switch assignment number of the currently selected conventional channel. However, if the switch assignment number is equal to or greater than 256 ÷ max. conventional channels per CEC/IMC + 33, the displayed number will not equal the switch assignment number of the currently displayed conventional channel. For example, if the switch assignment number of the currently selected conventional channel is 60, the displayed number will be 36. (Only lower

numbers representative of **bold-face** numbers in the tables are displayed for a given max. conventional channels per CEC/IMC.) Switch Number range = 33 – 48.

Channel Range
Range of conventional channels that current Switch Number is allocated. Channel Range = 1 – 255; maximum of 64 sequential channels per CEC/IMC.

Conventional Interface (Number)
CIA rack number that supports currently selected conventional channel. This field is not displayed if the currently selected channel is a remote conventional channel. Conventional Interface range = 1 or 2.

CI Channel
Conventional interface (VMIM/CIA set) channel number of currently selected conventional channel. For example, conventional channel 33 typically uses channel 1 of the second VMIM/CIA set, in which case "1" would be displayed. This field is not displayed if the currently selected channel is a remote conventional channel. CI Channel range = 1 – 32.

Local Conventional Channel Configuration
If the currently selected channel is a local conventional channel, the following high-level channel parameters are displayed for editing purposes. If the currently selected channel is a remote conventional channel, this information is not applicable; therefore, it is not displayed.

Switch Site
This is the VMIM that provides the CIA rack with its CEC/IMC interface (the VMIM that is actually connected to the CIA rack). Changing the Switch Site for the currently selected channel will also change the other thirty-one (31) channels within the same VMIM/CIA set. This change will not become permanent for all thirty-two (32) channels until a save and/or send is performed. Switch Site range = 1 – 32. Default = 0 or the currently selected VMIM for this 32-channel VMIM/CIA set (selected during configuration of another channel within this VMIM/CIA set).

The VMIM selected must be actually connected (wired) to the CIA rack, for example, if the currently selected local conventional channel is interfaced by CIA rack 2, and CIA rack 2 is connected to VMIM 10, "10" should be selected. Select the required VMIM site assignment number from the drop-down list.

Line Type
Select 2-wire (simplex) or 4-wire (duplex) line interfacing by selecting the respective option button within this group. Selection must match the line connection requirements to/from the conventional base station for the currently selected channel. Default is 4-wire.

Coupling
Select Tx/Rx Coupled or No Coupling by selecting the respective option button. If coupling is selected, a conventional channel control command which changes the base station's transmit frequency will also change its receive frequency and vice-versa. Default is Tx/Rx Coupled.

NOTE

For the C3 Maestro for Windows NT console, always select "Tx/Rx Coupled."

VOX/COR
Select either VOX (voice activated) or COR (carrier operated relay) receive activation by selecting the respective option button. If VOX activation is selected, conventional channel-originated calls on the currently selected conventional channel are detected by the CEC/IMC (calls "trip") when the channel's line audio exceeds the VOX threshold point specified by VOX Thres (see following text). If COR activation is selected, conventional channel-originated calls on the currently selected conventional channel are detected by the CEC/IMC based upon E-lead status at the CI Board. Default is VOX.

VOX Thres (VOX Threshold)
This level setting, in dBm, establishes the turn-on or trip-point for VOX activation. The set level is only valid if the VOX option button is selected (see previous text). The turn-off or un-trip point is approximately 4 dB lower than the turn-on point. Each VOX circuit in a CI Board (one per channel) has a fast attack time and a long decay time. This provides rapid CEC/IMC channel assignment for a conventional call and it prevents turn-off (VOX un-trip) between spoken words during a call. VOX Threshold range = -37 dBm – -3 dBm, default = -34 dBm.

NOTE

The VOX threshold and 2175 Hz hold tone level settings are now also stored at the CEC/IMC Manager's hard disk. This is a change from previous versions, which stored the VOX threshold and 2175 Hz hold tone level settings only at the CEC/IMC.

Normally, a channel's VOX threshold level should be set just above (approximately 3 dBm) the noise floor of the respective line to and from the conventional base station. With this setting, the VOX will not trip when the station is squelched and it will immediately trip from the increase in line noise when the station unsquelches. Alternately, a channel's VOX threshold may be set much higher than the noise floor (10 dBm or more) so it will only trip on voice signals.

Relay Function

In some cases, a Conventional Concentrator Card is utilized to interconnect lines between conventional base stations and the CI Boards within the CEC/IMC. In these cases an Audio Concentrator Card is not used. The following three (3) mutually exclusive options configure the consoles' ability to control relays located on the Conventional Concentrator Card when the currently selected conventional channel is programmed into a communication module. Select the required option by selecting the respective option button. To avoid conflicts between different console commands, it is recommended that all channels on a common Conventional Concentrator Card be configured identically. Refer to *CEC/IMC Digital Audio Switch Installation, Set-up and Troubleshooting*, LBI-38938, for connection and wiring details. Relay Function default = "None."

None

Select this option if no relays are present, if the relays are present but not used (not wired), or if a console must not have the ability to toggle the relays. Always select "None" if the currently selected channel connects to the CEC/IMC through an Audio Concentrator Card (no relays) or a Conventional Concentrator Card wired in standard configuration (relays not utilized).

Remote Control

Select this option if the currently selected conventional channel is connected through a Conventional Concentrator Card and the card is wired in remote controller enable/disable configuration and consoles should be allowed to toggle the relays by sending remote enable/disable commands (for example, **F1** function key from the C3 Maestro console's conventional function note card). When remote control is enabled, remote controllers are paralleled with the CEC/IMC. When disabled, assuming recommended wiring for this card configuration, remote controllers are disconnected from the stations.

Standby Site

Select this option if the currently selected conventional channel is connected via a Conventional Concentrator Card and the card is wired in main/standby station configuration and consoles should be allowed to toggle the relays by sending main/standby commands (for example, **F6** function key from C3 Maestro console's conventional function note card). When the relays are toggled to the standby position, assuming recommended wiring for this card configuration, standby (back-up) conventional base stations are connected and main (primary) stations are disconnected.

Control Signaling

The CEC/IMC can be interfaced to tone and/or DC remote controlled conventional base stations with or without E&M signaling. Each CEC/IMC conventional channel must be configured accordingly. Remote control signaling selection is provided by this group of option buttons. For the currently selected channel, select the required option by selecting the respective option button. If modifications to standard tone/DC control signaling are required, refer to the low-level configuration information in Tone Control/DC Control Configuration ("State Tables," Etc.) on page 3-166. Control Signaling default = "Tone."

Tone

Standard tone signaling on all commands, no E&M M-lead signaling. Standard tone signaling can be modified per State Table (low-level) configuration on a per command basis.

Tone (E&M PTT)
Standard tone signaling on all but PTT (station transmit) commands, E&M M-lead signaling on PTT commands. Standard tone signaling can be modified per State Table (low-level) configuration on a per command basis.

Tone (Tone/E&M PTT)
Standard tone signaling on all commands, PTT commands also include E&M M-lead signaling. Standard tone signaling can be modified per State Table (low-level) configuration on a per command basis.

DC
Standard DC (direct current) signaling on all commands, no E&M M-lead signaling. Standard DC signaling can be modified per State Table (low-level) configurations on a per command basis.

DC (E&M PTT)
Standard DC signaling on all but PTT commands, E&M M-lead signaling on PTT commands. Standard DC signaling can be modified per State Table (low-level) configurations on a per command basis.

DC (DC/E&M PTT)
Standard DC signaling on all commands, PTT commands also include E&M M-lead signaling. Standard DC signaling can be modified per State Table (low-level) configurations on a per command basis.

Causeway
The EDACS Causeway feature allows direct or "hard" patching/simulselecting of a conventional channel to a trunked talk group. Each conventional channel can be Causeway patched/simulselected to a trunked group using the trunked group's Group ID (GID) number. See Section 3.14.2, Causeway Patch / Simulselect, for more information on Causeway Patch/Simulselect operation. The Causeway group in the Conventional Channel Configuration dialog box is the configuration point for Causeway. Causeway default = "None."

NOTE

The maximum number of conventional channels configurable for Causeway operation may be limited by EDACS license privileges. See FEATURE DATA in Chapter 4 for more information.

None
Select this option button if no Causeway operation is desired for the currently selected conventional channel.

Patch
Select this option button if the currently selected conventional channel requires Causeway patch operation. Entry of a GID number is also required (see Group ID (GID)).

Simulselect
Select this option button if the currently selected conventional channel requires Causeway simulselect operation. Entry of a GID number is also required.

Group ID (GID)
If Patch or Simulselect is selected, a number must be entered in this text box to specify the group ID number for the Causeway patch/simulselect. If the EDACS trunked system is equipped with a System Manager, the entered number should be a valid GID number in the System Manager's GID database. Upon entering a valid GID number, its alias (name) will be displayed per the current GID database stored on the CEC/IMC Manager's hard disk drive. If no alias exists for the entered GID, "NO_ALIAS" will be displayed. Group ID (GID) range = 0 (zero) – 2047.

Delete

Choose the **Delete** button to delete the currently selected conventional channel configuration and return to the default configuration. A Message Box will be displayed asking you to confirm (**Yes**) or (**No**) the **Delete** command.

Save and Send High-level Configurations

Any Conventional Channel Configuration dialog box changes must be sent before the changes will come into effect at the CEC/IMC. This

reprograms the CCI and VMIM Controller Boards. If after making changes, a save is performed but a send is not, the actual CEC/IMC conventional channel operation will differ from the displayed settings upon re-entering the Conventional Channel Configuration dialog box.

Save

Choose the **Save** button to save the currently selected local conventional channel's configuration to the CEC/IMC Manager's hard disk drive. If during the current edit session, any other channels' configurations have changed, these channels are not saved. A remote conventional channel's configuration cannot be saved. All of the channel's high-level and low-level configurations are saved at the CEC/IMC Manager.

Send

Choose the **Send** button to send the currently selected conventional channel's high-level and low-level configuration to the CEC/IMC. A **Send** also automatically saves the currently selected channel's configuration to the CEC/IMC Manager. Configuration data is distributed to the channel's VMIM/CIA set as required. All settings affect (are programmed/stored within) the CCI Controller Board and the CI Boards within the respective CIA rack. In addition, Causeway settings also affect the respective VMIM Controller Board.

State Table

Choose the **State Table** button to display either the Tone Controlled Station State Table Mapping dialog box or the DC Controlled Station State Table Mapping dialog box. The control signaling type selected earlier (above) determines which dialog box will be displayed when **State Table** is chosen. Tone Control/DC Control configuration on the currently selected conventional channel is provided by these dialog boxes. If any changes have been made and not saved, you will be prompted (Write Changes to Disk?) to save and display one of the above state table dialog boxes (**Yes**), display one of the above state table dialog boxes without saving (**No**), or cancel the **State Table** command (**Cancel**) and remain in the Conventional Channel Configuration dialog box. See Tone Control/DC Control Configuration ("State Tables," Etc.) on page 3-166 for additional details.

Close

Choose the **Close** button to exit the Conventional Channel Configuration dialog box and return to the CEC/IMC Manager main window. Any configuration changes not saved will be lost; there is **no** prompt to save any changes before exiting.

Tone Control/DC Control Configuration ("State Tables," Etc.)

Conventional channel Tone Control/DC Control (low-level) configurations primarily involve "state table" configurations used to specify tone and DC-controlled signaling requirements. Each conventional channel has a corresponding state table. In many cases, state table changes are not necessary since default values match standard conventional base station remote control signaling requirements.

The following commands are supported on both tone and DC configurations.

Table 8 Conventional Base Station Commands

COMMAND	DEFINITION
SET TX FREQ 1	Set to transmit on frequency 1.
SET TX FREQ 2	Set to transmit on frequency 2.
SET TX FREQ 3	Set to transmit on frequency 3.
SET TX FREQ 4	Set to transmit on frequency 4.
SET TX FREQ 5	Set to transmit on frequency 5.
SET TX FREQ 6	Set to transmit on frequency 6.
SET TX FREQ 7	Set to transmit on frequency 7.
SET TX FREQ 8	Set to transmit on frequency 8.
SET RX FREQ 1	Set receive frequency to frequency 1.
SET RX FREQ 2	Set receive frequency to frequency 2.
SET RX FREQ 3	Set receive frequency to frequency 3.
SET RX FREQ 4	Set receive frequency to frequency 4.
SET RX FREQ 5	Set receive frequency to frequency 5.
SET RX FREQ 6	Set receive frequency to frequency 6.

COMMAND	DEFINITION
SET RX FREQ 7	Set receive frequency to frequency 7.
SET RX FREQ 8	Set receive frequency to frequency 8.
REPEAT ENABLE	Enable Repeater.
REPEAT DISABLE	Disable Repeater.
CG ENABLE	Enable Channel Guard.
CG DISABLE	Disable Channel Guard.
CG MON ENABLE	Enable Channel Guard Monitor (disabled on PTTs).
CG MON DISABLE	Disable Channel Guard Monitor.
SCAN ENABLE	Scan Enable.
SCAN DISABLE	Scan Disable.
SIM MON ENABLE	Enable simultaneous monitor.
SIM MON DISABLE	Disable simultaneous monitor.

Tone Controlled Station

If "Tone" was selected for Control Signaling in the Conventional Channel Configuration dialog box, choosing the **State Table** button will display the Tone Controlled Station State Table Mapping dialog box, Figure 36. If any changes have been made and not saved, you will be prompted (Write Changes to Disk?) to save them and display the Tone Controlled Station State Table Mapping dialog box (**Yes**), display the Tone Controlled Station State Table Mapping dialog box without saving (**No**), or cancel the **State Table** command (**Cancel**) and remain in the Conventional Channel Configuration dialog box.

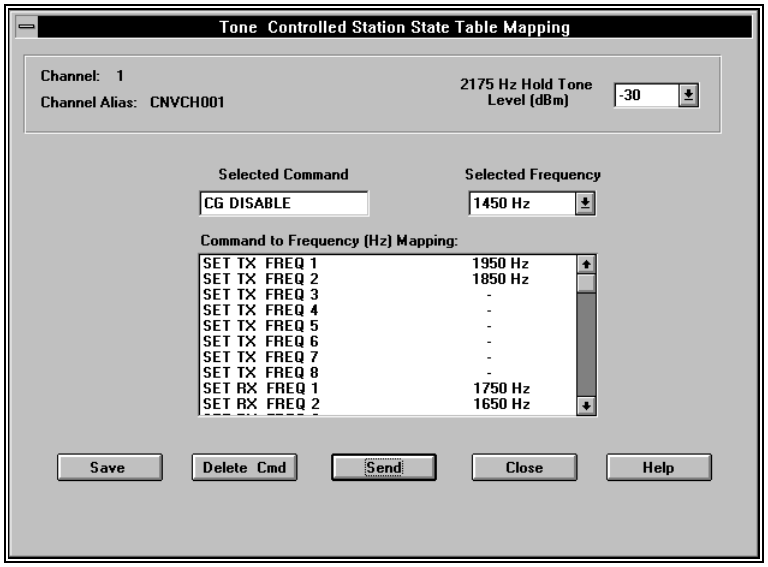


Figure 36 Tone Controlled Station State Table Mapping Dialog Box

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

The Tone Controlled Station State Table Mapping (low level configuration) dialog box maps to a state table located on the CI Board for the selected channel. This state table is what the CI Board uses to control the base station. Programming the state tables configures the CEC/IMC to send the tone control signal that matches the conventional base station configuration for the desired function. It will not be possible to program state tables at the CEC/IMC without knowing the corresponding base station's tone control signal configuration. Tone stations' commands are controlled with Secur-It™, function, and hold (PTT only) tones. There is no real definition of current state, so regardless of the "current state" of the station, the same tone will always be generated for a requested command.

The currently selected channel (selected previously in the Conventional Channel Configuration dialog box) is displayed in the read only Channel field with its associated Channel Alias displayed below.

2175 Hz Hold Tone Level
The 2175 Hz hold tone level should be set in accordance with the level required at the conventional base station and line loss between the CEC/IMC and the base station. Each conventional channel can be individually set to the required level. See the applicable tone control shelf maintenance manual for additional details on tone remote controlled base stations as necessary. Select the required level from the 2175 Hz Hold Tone Level drop-down list box, the range of values is -45 to -20 dB, default value is -33.

Command to Frequency Mapping
Configure a command by selecting it in the Command to Frequency Mapping list box, the selected command will appear in the Selected Command text box. Assign (map) a control tone frequency to that command by selecting the required value from the Selected Frequency drop-down list box. The range of values is 1050 to 2050 Hz. Repeat for each command to be configured.

Delete Cmd

Choose the **Delete Cmd** button to unconfigure ("delete") a command.

Save and Send Tone Control Configurations

When programming is complete for a channel, the new configurations must be sent to the CI Board before they will take effect. The new configurations will also be saved to the CEC/IMC Manager hard disk when sent to the CEC/IMC.

Save

Choose the **Save** button to save the currently selected local conventional channel's configuration to the CEC/IMC Manager's hard disk drive. A remote conventional channel's configuration cannot be saved. All of the channel's Tone Control configuration is saved at the CEC/IMC Manager, including the 2175 Hz hold tone level, in previous versions this setting was saved only at the CEC/IMC.

Send

Choose the **Send** button to send the currently selected conventional channel's low-level configuration to the CEC/IMC. Configuration data is distributed to the channel's VMIM/CIA set as required. All settings effect (are programmed/stored within) the CCI Controller Board and the CI Boards within the respective CIA rack. A **Send** will also automatically save the configuration at the CEC/IMC Manager.

Close

Choose the **Close** button to exit the Tone Controlled Station State Table Mapping dialog box and return to the Conventional Channel Configuration dialog box. If any changes have been made and not saved, you will be prompted (Write Changes to Disk?) to save exit (**Yes**), exit without saving (**No**), or cancel **Close** command (**Cancel**) and remain in the Tone Controlled Station State Table Mapping dialog box.

DC Controlled Station

If "DC" was selected for Control Signaling in the Conventional Channel Configuration dialog box, choosing the **State Table** button will display the DC Controlled Station State Table Mapping dialog box, Figure 37. If any changes have been made and not saved, you will be prompted (Write Changes to Disk?) to save and display the DC Controlled Station State Table Mapping dialog box (**Yes**), display the DC Controlled Station State Table Mapping dialog box without saving (**No**), or cancel the **State Table** command (**Cancel**) and remain in the Conventional Channel Configuration dialog box.

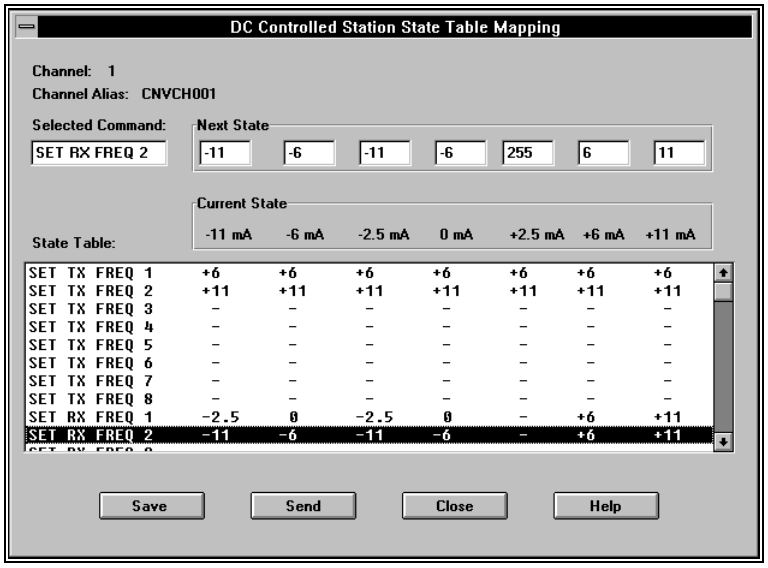


Figure 37 DC Controlled Station State Mapping Dialog Box

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

The DC Controlled Station State Table Mapping (low level configuration) dialog box maps to a state table located on the CI Board for the selected channel. This state table is what the CI Board uses to control the base station. DC stations' commands are controlled by applying different current levels on a wire pair to select the required functions.

Programming the state tables configures the CEC/IMC to send the DC control signal that matches the conventional base station configuration for the desired function. It will not be possible to program state tables at the CEC/IMC without knowing the corresponding base station's DC control signal configuration.

The currently selected channel (selected previously in the Conventional Channel Configuration dialog box) is displayed in the read only Channel field with its associated Channel Alias displayed below.

State Table
The State Table list box contains all of the possible programmable commands for a base station. Select the required commands to program from this list box, the selected command will be displayed in the Selected Command text box.

Current State
The Current State field displays the control current levels used to control the DC control base station.

Next State
The Next State field has seven text boxes which can be edited with the required DC levels for the command displayed in the Selected Command text box. The DC levels entered for the selected command must match the base station levels for proper remote control of the base station.

For example: A conventional base station with two transmit frequencies and two receive frequencies with Channel Guard enable/disable capabilities. The station configuration and channel programming might look something like the following tables.

Table 9 DC Controlled Station State Configuration

FUNCTION	DC CONTROL CURRENT IN MILLIAMPS*						
	-11	-6	-2.5	0	+2.5	+6	+11
2 FREQ TX 2 FREQ RX WITH CHANNEL GUARD DISABLE	RX - F2 CG DISABLE	RX - F2 WITH CG	RX - F1 CG DISABLE	RX - F1 WITH CG	N/A	TX - F1	TX - F2

* +2.5 mA is not supported in this example

Table 10 DC Controlled Station State Mapping

COMMAND	DC CONTROL CURRENT (mA)						
(FUNCTION)	-11	-6	-2.5	0	+2.5	+6	+11
SET TX FREQ 1	+6	+6	+6	+6	+6	+6	+6
SET TX FREQ 2	+11	+11	+11	+11	+11	+11	+11
SET RX FREQ 1	-2.5	0	-2.5	0	–	+6	+11
SET RX FREQ 2	-11	-6	-11	-6	–	+6	+11

CG ENABLE	-6	-6	0	0	–	+6	+11
CG DISABLE	-11	-11	-2.5	-2.5	–	+6	+11

The columns beneath the DC Control Current heading represent the next state the station must go to implement a new command; for example, if the station is presently at the -11 mA state and receives a DC control current of -2.5 mA, the station will know that this is a command to "SET RX FREQ 1 WITH CG ENABLED" based on its configuration (the station will then be at the -2.5 mA state). The DC channel programming also specifies that a non-transmit state is not allowed if the station is in a transmit state (a transmit command will not be pre-empted by a non-transmit command).

Save and Send DC Control Configurations

When programming is complete for a channel, the new configurations must be sent to the CI Board before they will take effect. The new configurations will also be saved to the CEC/IMC Manager hard disk when sent to the CEC/IMC.

Save

Choose the **Save** button to save the currently selected local conventional channel's configuration to the CEC/IMC Manager's hard disk drive. A remote conventional channel's configuration cannot be saved. All of the channel's DC Control configuration is saved at the CEC/IMC Manager.

Send

Choose the **Send** button to send the currently selected conventional channel's low-level configuration to the CEC/IMC. Configuration data is distributed to the channel's VMIM/CIA set as required. All settings effect (are programmed/stored within) the CCI Controller Board and the CI Boards within the respective CIA rack. A **Send** will also automatically save the configuration at the CEC/IMC Manager.

Close

Choose the **Close** button to exit DC Controlled Station State Table Mapping dialog box to the Conventional Channel Configuration dialog box. If any changes have been made and not saved, you will be prompted (Write Changes to Disk?) to save exit (**Yes**), exit without saving

(**No**), or cancel the **Close** command (**Cancel**) and remain in the DC Controlled Station State Table Mapping dialog box.

3.15 LOGGING RECORDER CONFIGURATION

The **L**ogging **R**ecorder **I**nterface **M**odule (**LRIM**) interface is used to record audio for selected units, groups and conventional channels. The CEC/IMC supports four (4) LRIM devices, each device supporting up to 64 modules and 32 channels. Each module assigns a unit, group, or conventional channel to a specific LRIM channel.

Logging Recorder configuration is performed from the Logging Recorder Configuration dialog box. From the CEC/IMC Manager menu bar select Configure System / CEC/IMC Configuration / LRIM to display the Logging Recorder Configuration dialog box, Figure 38.

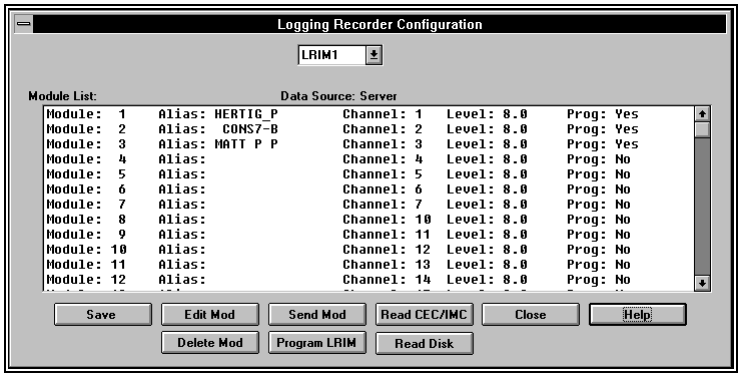


Figure 38 Logging Recorder Configuration Dialog Box

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

The current Logging Recorder is displayed in the drop-down list box at the top center of the Logging Recorder Configuration dialog box. Select the desired Logging Recorder to view or configure from this list box (LRIM 1 - 4).

The Module List list box contains all of the programmable (configurable) modules for the selected Logging Recorder. The module number, entity alias, channel number, and output level (volume) are

displayed in this list box. Above this list box is a read-only field which identifies the database source.

Read CEC/IMC

Choose the **Read CEC/IMC** button to read the programming database from the selected LRIM.

Read Disk

Choose the **Read Disk** button to display the current configuration stored on the CEC/IMC Manager hard disk for the selected LRIM.

Delete Mod

Choose the **Delete Mod** button to delete ("de-program") the currently selected modules (more than one module may be selected) from the LRIM database.

3.15.1 LRIM Module Configuration

The Logging Recorder currently supports the programming of units, groups, and conventional channels. Select the desired module (only one module may be selected at a time) from the Module List list box and then choose the **Edit Mod** button to display the LRIM Module Edit dialog box.

Edit Mod

Choose the **Edit Mod** button to display the LRIM Module Edit dialog box. Configuration of Logging Recorder modules is performed in the LRIM Module Edit dialog box, Figure 39.

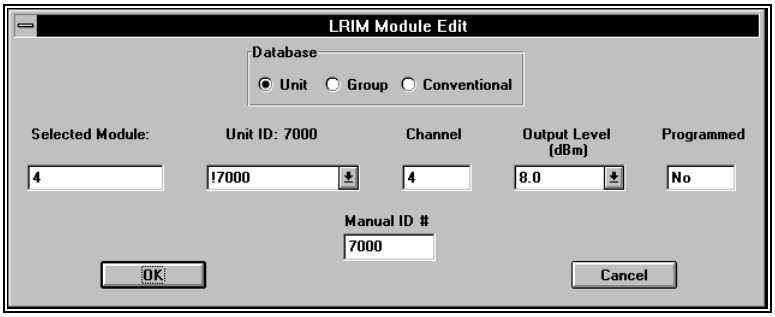


Figure 39 LRIM Module Edit Dialog Box

Press the **F1** key to access the Help function.

The Selected Module text box displays the module number selected in the Logging Recorder Configuration dialog box, this is read-only information.

Select the database (unit, group, or conventional) for the entity you wish to program by selecting the appropriate option button at the top of the dialog box. This will automatically program the LRIM Module Edit dialog box with all entities belonging to that database. The desired entity for programming is selected from the drop-down list box which will be labeled according to which database was selected (Unit ID, Group ID, or Conv ID). Units, groups, and conventional channels are all programmed in the same manner.

NOTE

The LRIM also handles the patch/simulselect feature of the CEC/IMC. If multiple groups are patched/simulselected together then audio transmissions on the SAID (System Assigned ID) will be routed to each of those groups programmed at the LRIM.

The Channel text box will automatically display the channel corresponding to the selected module in the Logging Recorder Configuration dialog box. This value may be edited with any available channel. Summation may be obtained by assigning multiple modules to the same channel. By assigning each module a unique channel number, summation will not occur.

Volume levels are adjusted using the Output Level drop-down list box and selecting the desired volume. The volume range is -25 dBm as the minimum and +10 dBm as the maximum.

The Programmed text box shows the program status at the Logging Recorder. This text box is read-only information. A "Yes" indicates the module is programmed, a module is programmed in the Logging Recorder Configuration dialog box in one of two ways:

- selecting individual modules in the Logging Recorder Configuration dialog box and choosing the **Send Mod** button (changed data must be saved to disk prior to programming), or

– choosing the **Program LRIM** button (changed data must be saved to disk prior to programming).

A "No" indicates the module is NOT programmed, a module is "de-programmed" (deleted) by choosing the **Delete Mod** button in the Logging Recorder Configuration dialog box.

If the ID number of the entity to program is known, enter this ID in the Manual ID text box to immediately select that entity without having to scroll through what may be a rather lengthy list in the above drop-down list box.

OK

Choose the **OK** button to program the selected module and return to the Logging Recorder Configuration dialog box. Choosing **OK** does not save or send the module programming data.

Cancel

Choose the **Cancel** button to return to the Logging Recorder Configuration dialog box without making any changes to the selected module.

3.15.2 Save and Send LRIM Module Configurations

After a module has been edited in the LRIM Module Edit dialog box, the new configuration must be saved to the CEC/IMC Manager hard disk before programming the CEC/IMC MOM.

NOTE

Summation will occur if two or more modules have been assigned the same channel number. If you do not desire summation, assign each module a unique channel number (between 1 and 32).

Save

Choose the **Save** button to save the selected module configurations—only modified modules are saved—to the CEC/IMC Manager hard disk, choosing **Save** does not reprogram the LRIM.

Send Mod

Choose the **Send Mod** button to send the selected module configurations (more than one module may be selected) to the CEC/IMC MOM. This action will program the selected module.

NOTE

This function can be very important during software upgrades. Part of the upgrade procedure is to clear NOVRAM on all boards in the CEC/IMC. This function allows you to reprogram the LRIM after the NOVRAM has been cleared with the configuration data stored on the CEC/IMC Manager hard disk (See Read Disk).

Program LRIM

Choose the **Program LRIM** button to send all configured module data for the selected LRIM to the CEC/IMC MOM. This command is analogous to a send all (modules) command.

Close

Choose the **Close** button to exit the Logging Recorder Configuration dialog box and return to CEC/IMC Manager main window. Choosing this command does not save or send any changes made to LRIM configuration.

3.16 EDACS DATA GATEWAY (EDG) CONFIGURATION

Each EDACS Data Gateway (EDG) channel should be allocated a TDM time slot. This is accomplished using a CIM designated for EDG use. In addition, EDG configurations should be setup in accordance with one or more of the following manuals: *EDG Technical Description* (LBI-38961), *EDG Installation and Maintenance* (LBI 38962), *EDG User's Reference Manual* (LBI-38963), and *EDG Configuration Reference Manual* (LBI-38964).

3.17 CENTRALIZED ACTIVITY LOGGER (CAL) CONFIGURATION

The Centralized Activity Logger (CAL) computer uses the call activity information provided by the Centralized Activity Module (CAM) to generate usage and billing information. The CAL is connected to the CAM Controller Board (the CAM consists of this single Controller Board) by a synchronous high-speed HDLC serial control data link. This CAM-to-CAL HDLC link can be set by DIP switches on the CAM Controller Board for either 60k or 360k baud operation. Refer to *CEC/IMC Digital Audio Switch Installation, Set-Up, and Troubleshooting* (LBI-38939) for specific information on DIP switch settings and cable connections.

3.18 AUXILIARY I/O CONFIGURATION

Every CEC/IMC Controller Board has eight input (I) lines and eight output (O) lines that can be used for auxiliary I/O interfacing to two-state external devices.

The V5.0 CEC/IMC and CEC/IMC Manager for Windows NT fully support the definition and configuration of up to 255 auxiliary I/O lines for console use. Configuration of single control input and output, and interlocking group control is supported. However, the first release of the console does not support interlocking group control, and will not obtain event labels and message information from the CEC/IMC Manager. Refer to the *C3 Maestro for Windows NT Engineering Release Notes* (1551-CXC 112 887 Uen) for the console limitations in its first release. Subsequent releases of the console to support this feature should require no further changes in the CEC/IMC.

Since the number of I/O controls has increased from 30 to 255, the key and message event information is not stored in MOM Controller NOVRAM. Configuration I/O information read from the MOM Controller by the CEC/IMC Manager doesn't include this information; however, the current state of the I/O link will be available.

Each I/O line can be individually defined at the CEC/IMC Manager for console I/O use. For example, an output can be used to turn on a siren when a console operator presses a key and an input could be used for alarm monitoring. As mentioned previously, up to 255 different I/O events can be configured at the CEC/IMC Manager. Event configuration is done from the Auxiliary I/O Event Configuration dialog box, Figure 40. From the CEC/IMC Manager menu bar select

Configure System / System Options / Auxiliary I/O to display the Auxiliary I/O Event Configuration dialog box.

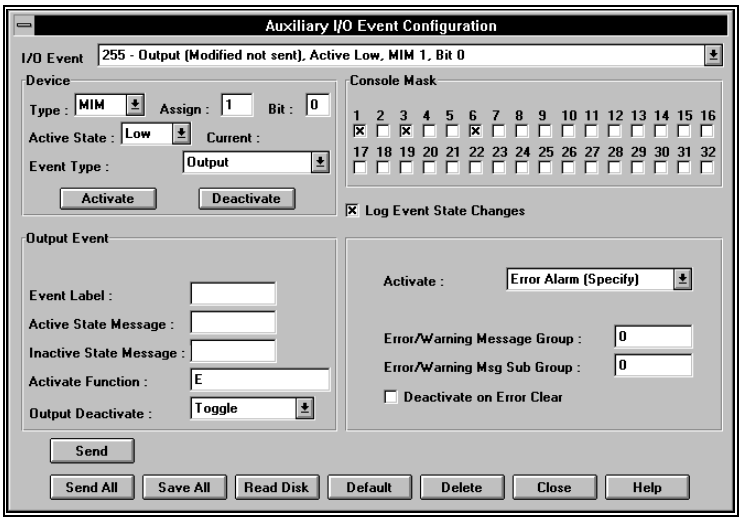


Figure 40 Auxiliary I/O Event Configuration Dialog Box

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key).

3.18.1 I/O Event Configuration

The I/O event is displayed in the drop-down list box along the top of the dialog box. This list box contains all of the configured events (out of 255 possible configurable events). Select an event to view or configure from this list box. An event must be inactive (not sent to MOM or deleted) before any parameters can be changed. To configure a new event select an unused event number.

All I/O events must have certain common characteristics: event type (input or output), active state (high or low), and device type, assignment, and bit number. These characteristics are configured in their respective fields located in the upper left quadrant of the dialog box. Additionally, all events may be defined to cause an "Audio Event Warning" log at the CEC/IMC Manager on an event state change by selecting the Log Event State Changes check box. All events except for

error/warning triggered outputs are assigned to consoles by use of a console mask.

Type (Device) and Assign (Device)
Each event is assigned to a specific interface module (device) within the CEC/IMC. The Device Type and Assignment fields uniquely identify the Controller Board to which the I/O equipment will be wired. All Controller Boards support Aux I/O except XLTR Controller Boards. Select the device type from the Type drop-down list box; enter the assignment number of the selected device in the Assign text box.

Bit
The Bit field specifies which (Controller Board) input or output bit (0 - 7) is assigned to the event. There are eight input bits and eight output bits per Controller Board. Enter the bit value (0 - 7) in the Bit text box.

Active State
Each I/O event must be assigned an active state – "High" or "Low." An output event will be set to its active state whenever its trigger condition is present. An input event will display its message at the console whenever the specified input transitions to its active state. The high or low state of an I/O event is relative to the actual state of the I/O pin as seen by the Controller Board's processor. This may be inverted from the state of the user equipment connected to the Auxiliary I/O Concentrator Card due to the wiring of the external connections and the buffering circuitry on the Controller Board. See *CEC/IMC Digital Audio Switch Installation, Set-Up and Troubleshooting* (LBI-38938) for details on the logic characteristics and wiring connections to Controller Board auxiliary I/O ports. Select either High or Low from the Active State drop-down list box.

Event Type
Each event must be defined as either an output event or an input event. Output events change state in response to the specified trigger condition. Input events display a message (up to eight characters in length) at consoles in response to a change in state of the respective input bit. Interlocking group control (Output Interlock), available only with the C3 Maestro for Windows NT console, will allow tying up to eight output events together; acting on one event will also act on the other events in that "interlocked group." As mentioned earlier, this console feature is not available in the first release, and see *C3 Maestro for Windows NT Engineering Release Notes* (1551-CXC 112 887 Uen) for the console limitations in its first release. See *CEC/IMC Digital Audio Switch Installation, Set-Up and Troubleshooting* (LBI-38938)

for details on the wiring of the I/O ports/bits. Select the event type (Input or Output) from the Event Type drop-down list box.

Input Event

If Input is selected several other fields are affected and require configuration as described in the following paragraphs.

- The Console Tone Alarm drop-down list box will be displayed below the Event Type field, replacing the **Activate** and **Deactivate** buttons.
- The Input Message text box will be displayed in the lower right quadrant of the dialog box, replacing the Activate and Deactivate fields.
- The Message Window Text text box will be displayed in the lower left quadrant of the dialog box, replacing the Activate Function and Output Deactivate fields (all fields in this quadrant are currently not used, they are for future console development).

Console Tone Alarm
Use this field to specify if an alarm tone will be heard at the consoles for the event currently being configured. Select either Alarm Off or Alarm On from the drop-down list box.

Input Message

NOTE

The Input Message for C3 Modular/Desktop consoles must be UPPER CASE alphanumeric characters. There is no restriction for any other console type.

This field displays the input event's defined text message (8 characters max). This message is sent to any console that has been selected in the Console Mask field when the input becomes active. On the C3 Maestro console, the message will be displayed in the bottom left corner of the CRT. On the C3 Modular/Desktop console, the message is displayed in the 8-character alphanumeric LED display (see NOTE). Because these display positions are used for other messages, the I/O event message is displayed for approximately five (5) seconds and then cleared. Select Log Event State Changes for a more permanent record of the input event occurrence.

Output Event

If Output is selected several other fields are affected and require configuration as described in the following paragraphs.

- The **Activate** and **Deactivate** buttons will be displayed below the Event Type field, replacing the Console Tone Alarm drop-down list box.
- The Activate field will be displayed in the lower right quadrant of the dialog box, replacing the Input Message text box.
- The Activate Function and Output Deactivate fields will be displayed in the lower left quadrant of the dialog box, replacing the Message Window Text text box (all fields in this quadrant are currently not used, they are for future console development).

Activate
An output "trigger" must be specified for each output event. The output will be set to its active state on detection of this trigger condition. There are three basic classes of output triggers available:

- Console Key Press – **Alt+F1**/**Alarm 1** - **Alt+F8**/**Aux 4**
- Console Call – Station Busy, Station Select Busy, Emergency
- CEC/IMC Error/Warning occurrence

Select the trigger from the drop-down list box. If any Console Key Press trigger option is selected the Deactivate field will be displayed below the Activate field. If any Console Call or Error Alarm (any) trigger option is selected the Deactivate field will not be displayed. If Error Alarm (specify) or Warning Alarm (specify) trigger options are selected the Error/Warning Message Group and Error/Warning Msg Sub Group fields will be displayed below the Activate field. Continue I/O event configuration according to type of trigger selected (Console Key Press Trigger, Console Call Trigger, or Error/Warning Trigger).

Choose the **Activate** button to activate (enable) the selected output event.

Choose the **Deactivate** button to deactivate (disable) the selected output event. An event must be deactivated before it may be modified.

Console Key Press Trigger
Output events may be set to trigger on a console operator's key press. Eight keys are available at each console for event triggering. The C3

Maestro uses **Alt+F1** - **Alt+F8** (press and hold the **Alt** key and then press the **F1** - **F8** key). The C3 Modular console uses the **ALARM 1 - 4** and **AUX 1 - 4** keys for the same purpose. Each event can be specified to either deactivate upon release of the key (momentary) or toggle on each subsequent key press (hold).

Deactivate

For a toggled event (changes state with each key press) key presses from different consoles can toggle the current state. For example, console 1 may toggle the event active and console 6 may toggle the event back to the inactive state. For a momentary event release of the key press (at the console) will deactivate the event back to the inactive state. Select either Toggle or Momentary.

Console Call Trigger

A console call trigger will activate an output event when the specified condition is detected at the Console Interface Module (CIM). The event deactivates when the condition is no longer present. The three possible settings are:

Station Busy – Active whenever any transmit or receive audio is present at the console.

Station Select Busy – Active whenever any transmit or receive **select** audio is present at the console.

Emergency – Active whenever emergency tone is present at the console. This event will deactivate if the "Alarm Reset" function is used at the console to clear the emergency tone, but leave the emergency active.

Error/Warning Trigger

An Error/Warning trigger will activate an output event when an error or warning occurs at the CEC/IMC.

Error Trigger

An error trigger is similar to a warning trigger except that it may be defined to automatically deactivate when the error condition clears. The MOM will keep track of the number of the specified errors that are active and will deactivate the output when all have cleared, if the Deactivate On Error Clear check box is selected. Error events may also be defined to require manual deactivation, as for warning alarms. If Error Alarm (any) is specified as the trigger, the output will activate on receipt of any error message at the MOM. The output must be manually deactivated.

Warning Trigger
A warning trigger will set the output event active on receipt of a warning with the specified group/sub-group at the MOM. Since warnings are never cleared (one-shot event) all warning triggers will require manual deactivation using the CEC/IMC Manager's I/O configuration screen **Deactivate** button. The output will remain active until it is manually reset from the CEC/IMC Manager.

Error/Warning Message Group and Error/Warning Msg Sub Group
All Error/Warning triggers are specified by the group/sub-group used in the error/warning log. When an error/warning trigger is selected, the message group/sub-group fields are displayed. For example, for error message Exx-yyy, xx represents the Message Group and yyy represents the Message Sub Group. (See "Log Event State Changes" for an example of an error message.) Enter the desired message group/sub-group from the list of error/warning conditions found in Logged Error/Warning Definitions.

Console Mask

Auxiliary I/O events are assigned to consoles by selecting the corresponding check box in the Console Mask field (upper right quadrant of the dialog box). For an output event this specifies which consoles may trigger the event. For example, if "Alt+F1" is specified as the event trigger (see "Activate" above) and consoles 1 and 6 are selected in the console mask, then the event can be triggered by pressing **Alt+F1** at either console 1 or console 6. In the case of a toggled event (changes state with each key press) key presses from different consoles can toggle the current state. For example, console 1 may toggle the event active and console 6 may toggle the event back to the inactive state. An input event's message will be displayed simultaneously at all consoles specified in the console mask whenever the input goes active.

Log Event State Changes

When this check box is selected (default) the CEC/IMC Manager will log an "Auxiliary I/O - State Change" warning whenever the I/O event changes state. This provides a history of each activation/deactivation of the I/O event. If a defined event is expected to occur frequently, such as "station busy" at a console, the event logging should be disabled to

prevent overburdening the CEC/IMC Manager's warning system with auxiliary I/O state change warnings.

An output event state change will be logged with the following warning:

mm/dd/yy hh:mm:ss FF MIM 1 W17-130 Auxiliary I/O - State Change
Output 1 Active [Bit 0 High] Trig: E02-22

The output number, active/inactive state, bit value, absolute state (high/low) and trigger description will match the current event's data. The possible "Trig:" descriptions are:

- Console Key Press
- Station Busy
- Select Busy
- Emergency
- Any Error
- Error – Exx-yyy (shown)
- Warning – Wxx-yyy

An input event's state change warning is similar except the trigger field is not displayed.

Read and Delete I/O Event Definitions

Choose the **Delete** button to change the selected I/O event from enabled to modified-not-sent. The selected event remains on the CEC/IMC Manager hard disk, but is deleted from the CEC/IMC NOVRAM.

Choose the **Default** button to return the I/O event entry to the "default" (unconfigured) condition. If the event is enabled (sent to the CEC/IMC), it first must be deleted from the CEC/IMC. A confirm dialog box is displayed which will allow the request to be canceled, if necessary.

Choose the **Read Disk** button to view the I/O event configurations currently stored at the CEC/IMC Manager hard disk.

Save and Send I/O Event Definitions

After the I/O events are defined at the CEC/IMC Manager, the definitions must be sent to the MOM Controller Board. If the I/O event

data is not successfully broadcast to all required devices a "MOM Communication Error" or "Device not active" notify box will be displayed. The assigned Controller Board (device type and assignment in the I/O definition) must be installed and active for the event definition to operate. Normally, only modified event definitions are sent to the MOM.

Send

Choose the **Send** button to send the currently selected I/O event data to the MOM Controller Board. The key and message event information will be sent to but not stored in MOM Controller NOVRAM.

Send All

Choose the **Send All** button to send/resend all I/O event configurations. This is useful to refresh all I/O configurations if a Controller Board or console has been replaced or upgraded and has lost its I/O event data.

Save All

Choose the **Save All** button to save all I/O event configurations to the CEC/IMC Manager hard disk.

Close

Choose the **Close** button to exit the Auxiliary I/O Event Configuration dialog box and return to the CEC/IMC Manager main window. If any changes have been made and not saved, you will be prompted (Write Changes to Disk?) to save and exit (**Yes**), exit without saving (**No**), or cancel the **Close** command and remain in the dialog box (**Cancel**).

3.19 ACTIVATE TDM BUS SLOTS

No interface modules will receive the new bus and slot settings stored in the MOM until each one is reset. These are the settings from the various interface module configurations performed earlier in the setup procedure which were sent to the MOM when **Send** was performed from those dialog boxes. This can be done by cycling power or by individually resetting each interface module's Controller Board. This should be done **after both the bus and slot** configurations have been sent to the MOM.

If the CEC/IMC is equipped with firmware V4.03 or later, this can be done automatically from the CEC/IMC Manager by selecting the

Activate TDM Bus Slots function. From the CEC/IMC Manager menu bar select Configure System / CEC/IMC Configuration / Activate TDM Bus Slots to display the TDM Bus Slots dialog box. This dialog box allows the CEC/IMC Manager user to command the MOM to automatically reset all other Controller Boards in the CEC/IMC.

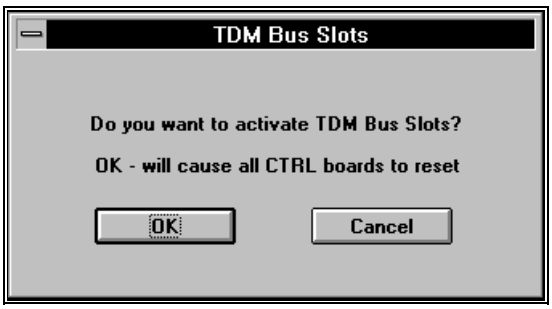


Figure 41 Activate TDM Bus Slots

Press the **F1** key to access the Help function.

OK

Choose the **OK** button to reset all Controller Boards which will activate the TDM Bus Slots.

Cancel

Choose the **Cancel** button to exit the TDM Bus Slots dialog box and return to the CEC/IMC Manager main window without activating TDM Bus Slots.

3.20 MULTISITE UNIT LOGOUT CONFIGURATION

The Unit/Group Location and Unit Logout dialog box provides several options to the CEC/IMC Manager user. These options are program unit timed logout, command unit logout, request unit location, request unit location by site, and request group location.

From the CEC/IMC Manager menu bar Select Configure System / System Options / Multisite Unit Logout to display the Unit/Group Location and Unit Logout dialog box, Figure 42.

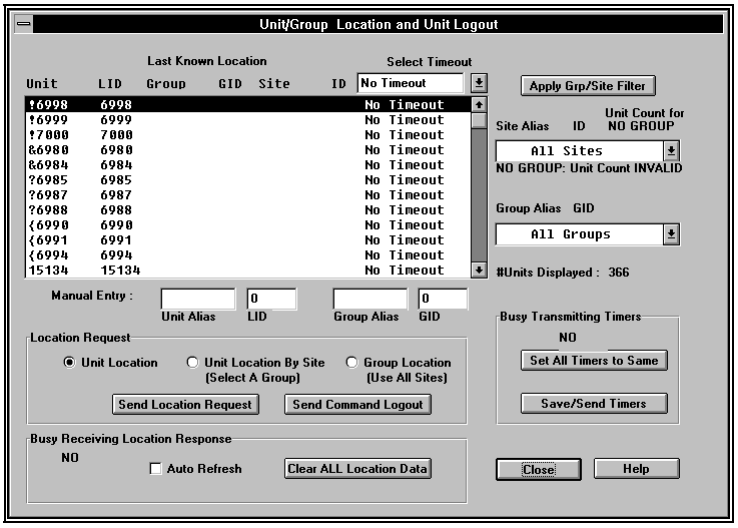


Figure 42 Unit/Group Location and Unit Logout Dialog Box

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

Close

Choose the **Close** button to exit the Unit/Group Location and Unit Logout dialog box and return to the CEC/IMC Manager main window.

When the Unit/Group Location and Unit Logout dialog box is open unit location data may be viewed at any time, and when closed the group and site data is cleared. This allows the operator to retrieve an updated snapshot of unit locations when necessary.

The multisite unit logout feature, controlled by the MOM Controller Board, can improve call routing efficiency by logging inactive radio units out of the multisite system. This prevents wide area (multisite) call routing to inactive units which would otherwise unnecessarily delay certain wide area group calls. Multisite Unit Logout has two modes of operation, Timed Logout and Command Logout. These two modes are NOT exclusive; if a situation develops where a unit must be command logged off, this can be done regardless of the Logout Timer status. A brief description of each follows.

The following terms are used to describe unit logout functions.

- **Activity**: A PTT or Radio Login.
- **PTT**: Push-To-Talk, keying a radio.
- **Radio Login**: Site message generated when units auto login. This can occur when a unit powers up or changes groups/sites and the unit is programmed for auto login capability.
- **Unit locate**: Defined by group and site that a unit is logged into.
- **Group locate**: Defined by number of units logged onto a group. This "Unit Count" is reported by each site.
- **Unit locate by Site**: View of all the individual location responses from selected sites and groups.

NOTE

In order for a call to NOT be routed to a particular group and/or site, ALL units must be logged off so that Group Count is equal to zero.

Timed Logout

A unit's multisite timer is set to a predetermined time each time it (the radio) keys. Timed logout logs units off of all sites after the requested unit has not shown any activity (keyed or login to another site) for the predetermined time. Multisite timers for all units are set-up in the Unit/Group Locations and Unit Logout dialog box and they are maintained by (stored in) the MOM Controller Board.

A unit timer is maintained for each unit, and has the characteristics listed below.

- Set at the CEC/IMC Manager and stored in MOM Controller Board NOVRAM.
- Set from 0 to 24 hours in 15 minute increments.
- All timers can be set to the same value.
- Unit Timers set to No Timeout never log off. This is used for units that show very little activity.
- Unit Timers decrement each minute but reset when a unit shows activity.
- ACTIVITY is defined as a PTT or radio login.
- ALL unit timers can be suspended from decrementing by unselecting (disabling) "Multisite Unit Logout" in the

System Options dialog box (Configure System / System Options / Multisite Settings). This does not reset unit timers or change unit timer reset values, so if "Multisite Unit Logout" is selected (enabled) the unit timers will again decrement from the previously set values.

Command Logout

Command logout instantly logs the requested unit off of all sites. The command logout option can be selected to mark and logoff operator selected units when it is not desired to have units automatically log off the CEC/IMC (timed logout).

Multisite Unit Logout has two modes of operation, Timed Logout and Command Logout. These two modes are NOT exclusive; if a situation develops where a unit must be command logged off, this can be done regardless of the Logout Timer status. A brief description of each follows.

NOTE

In order for a call to NOT be routed to a particular group/site, ALL units must be logged off so that Group Count is equal to zero.

Timed Logout

A unit's multisite timer is set to a predetermined time each time it (the radio) keys. Timed logout logs units off of all sites after the requested unit has not shown any activity (keyed or login to another site) for the predetermined time. Multisite timers for all units are set-up via the Unit/Group Locations and Unit Logout (Multisite Unit Logout in System Options menu) dialog box and they are maintained by (stored in) the MOM Controller Board.

A unit timer is maintained for each unit, and has the following characteristics:

- Set at the CEC/IMC Manager and stored in MOM Controller Board NOVRAM.
- Set from 0 to 24 hours in 15 minute increments.
- Set ALL timers to the same value.
- SEND timers by.

- Unit Timers set to No Timeout never log off. This is used for units that show very little activity.
- Unit Timers decrement each minute but reset when a unit shows activity.
- ACTIVITY is defined as a PTT or radio login.
- ALL unit timers can be suspended from decrementing by unselecting (disable) "Multisite Unit Logout" in the System Options dialog box (Configure System / System Options / Multisite Settings). This does not reset unit timers or change unit timer reset values, so if "Multisite Unit Logout" is selected (enable) the unit timers will again decrement from the previously set values.

Command Logout

Command logout instantly logs the requested unit off of all sites. The command logout option can be selected to mark and logoff operator selected units when it is not desired to have units automatically log off the CEC/IMC (timed logout).

3.20.1 Unit Timed Logout Configuration

Unit logout timers are set at the CEC/IMC Manager from the Unit/Group Location and Unit Logout dialog box. With the timer-based multisite unit logout option, each unit has a count-down timer in the MOM that is initialized at radio login and re-initialized at each radio PTT. The MOM periodically decrements each timer and when the timer for a particular unit times-out the CEC/IMC will either logout the unit, or query the unit if "Multisite Logout Polling" is enabled, and if there is no response to this query logout the unit. Each unit's timer can be programmed in 15-minute increments up to 24 hours. Typically, most timers will be set in the 8- to 10-hour range. Set the timers to the required amount.

Configure Unit Timed Logout.

The operator can select any unit for unit timer configuration from the list box displaying Unit Alias, LID, and Timeout value. The unit alias, LID, group alias, and GID will also be displayed in the Manual Entry fields (see below). The number of units available for selection is displayed at the lower right corner of the list box (# Units Displayed). The time-out value that is displayed for the units is the MOM Controller Board NOVRAM stored time. Select the time-out value from the Select Timeout drop-down list box, the selection choices are

listed in 15-minute increments from 15 minutes to 24 hours, including No Timeout.

Manual Entry
For timer based unit logout manual entries also can be made. These allow the operator to immediately jump to a unit or group that has a known ID or ALIAS by typing the ID or ALIAS in the appropriate Manual Entry text box instead of scrolling through the list of Aliases. The time-out value also can be manually entered in the Select Timeout field (text box portion of the Select Timeout drop-down list box), the drop-down list will go to the typed-in value; however, the value must be selected with the selection cursor to be recognized as the new time-out value. Enter either the Alias or ID and press the **Tab** key.

NOTE

The Group and Unit information displayed in their respective fields are not related to each other. The Unit Alias and LID are linked to the list box directly above these fields; the Group Alias and GID are linked to the drop-down list box above and right of these fields.

Save/Send Timers

Choose the **Save/Send Timers** button to save and send the timers when all the timers are set to the desired values. The transmission of the timers to the MOM Controller Board occurs at a rate of 3/second. The transmission status of the timer database is indicated by either YES (transmitting data) or NO (not or completed transmitting data), displayed below "Busy Transmitting Timers."

Set All Timers to Same

Choose the **Set All Timers to Same** button if it is necessary to set ALL timers to the same value after setting one timer to the desired value. Choosing **Set All Timers to Same** will cause ALL timers to be set to this new default timer setting and will transmit the new timers to the MOM Controller Board. The new timer setting becomes the default setting so any new units added to the database will have this default.

3.20.2 Command Unit Logout

The command logout function allows the operator to logoff a specified unit instantly, without waiting for the inactivity logout. The unit can be selected from the list box or manually entered (see below). This procedure can be repeated for as many units as necessary.

Manual Entry
Manual entries also can be made for command unit logout. These allow the operator to immediately jump to a unit that has a known LID or ALIAS by typing the LID or ALIAS in the appropriate Manual Entry text box instead of scrolling through the list of Aliases. Enter either the Unit Alias or LID and press the **Tab** key.

Send Command Logout

Choose the **Send Command Logout** button when any unit that must to be logged off immediately is selected. The selected unit will be logged off of the CEC/IMC, and the CEC/IMC Manager will update to show this change in unit location when **Send Command Logout** is executed.

3.20.3 Location Request

Three location request options are available; unit location, unit location by site, and group location. The location response from the MOM Controller Board for these requests is also sent to the System Manager.

Send Location Request

Choose the **Send Location Request** button when the desired unit, site, and group are selected in their respective list boxes, and the appropriate location request option button has been selected to update the unit database window with the location responses from the MOM Controller Board.

Clear ALL Location Data

Choose the **Clear ALL Location Data** button to clear the list box display of all location data. This can be done whenever the operator wishes to remove old data from the list box and display new or no data.

Apply Grp/Site Filter

Choose the **Apply Grp/Site Filter** button to "filter" a location request through the sites and groups selected in the drop-down list boxes below this button. This allows the operator to control the group and site

search parameters for location requests, and the display of "Last Known Location" will be limited by this filter.

Manual Entry

NOTE

The Group and Unit information displayed in their respective fields are not related to each other, the Unit Alias and LID are linked to the list box directly above these fields, the Group Alias and GID are linked to the drop-down list box above and to the right of these fields. Also, Grp/Site Filters are always applied to the "Last Known Location" list box. **HINT:** If a unit does not show up as expected be sure to check the Grp/Site Filters.

Manual entries also can be made for location requests. These allow the operator to immediately jump to a unit or group that has a known ID or ALIAS by typing the ID or ALIAS in the appropriate Manual Entry text box instead of scrolling through the list of Aliases. Enter either the Alias or ID and press the **Tab** key.

Unit Location

The location of a unit is defined as the group and site that the unit is currently logged onto. When the Unit ALIAS or LID of a particular unit is known, but the SITE and/or GROUP is unknown, this option can be used by the operator to find the unit's location. Select the desired unit from the list box. If the Auto Refresh check box is selected (along the bottom of the dialog box) this unit will have a unit location request sent to the MOM Controller Board about every ten seconds. This update will continue until the operator selects another unit. The group and site data is only updated for the highlighted unit and should be cleared periodically by choosing the **Clear ALL Location Data** button.

Select the unit whose location is desired from the list box (or manually enter) and select the Unit Location option button. The search may be "all-encompassing" by selecting All Sites and All Groups from their respective drop-down list boxes, or the operator may narrow the search by selecting some other combination of Site and Group and choosing the **Apply Grp/Site Filter** button to filter the search through these

narrower search parameters. Choose the **Send Location Request** button to execute the specified search. The Unit Locations will be displayed in the list box with their Last Known Location—Group Alias, GID, Site Alias, and (Site) ID.

Unit Location by Site

When the site is known but the unit is unknown this option can be used to obtain a list of all units on a particular site. The list can also be filtered to display only units that are logged onto a particular group or display all units in all groups on the site of interest. Select the desired combination of Site and Group from the two drop-down list boxes (Site Alias & ID and Group Alias & GID) and then choose the **Apply Grp/Site Filter** button.

Select the Unit Location By Site option button, select the Site of interest and a single Group or All Groups from their drop-down lists, then choose the **Apply Grp/Site Filter** button to initiate the specific search parameters. Choose the **Send Location Request** button to execute the specified search. The Unit Locations will be displayed in the list box with their Last Known Location—Group Alias, GID, Site Alias, and (Site) ID.

If All Groups was selected as the Group search parameter the Unit Count for the NO GROUP field will display zero, even though many units may be displayed from the search, because this field displays only those units belonging to a single particular Group selected in the Group drop-down list. Also, a "NO GROUP: Unit Count is INVALID" message will be displayed between the Site and Group drop-down list boxes for the same reason. If a single Group was selected for a search parameter, the Unit Count for <selected group> field will display the number of units found with the specified search parameters, and no message will be displayed between these list boxes.

Group Location

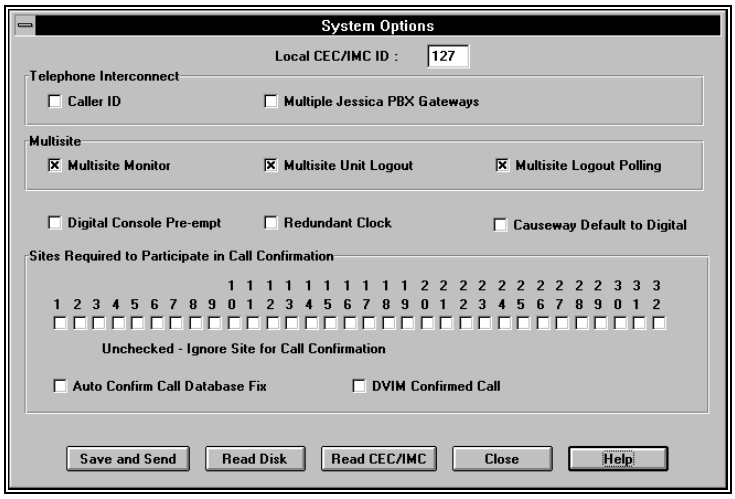
Group locations are defined as the number of units logged into the group of interest for each site. Unless the count of units in a group is zero, calls will always be routed to a secondary site if the site is wide area enabled. Select the group and site of interest from the Group and Site drop-down list boxes.

Select the Group Location option button, then select the Group of interest and a single Site or All Sites from their drop-down lists.

Choose the **Apply Grp/Site Filter** button to initiate the specified search parameters. Choose the **Send Location Request** button to execute the specified search. The Group Locations (units located) will be displayed in the list box.

3.20.4 Multisite Settings

Multisite options Timer Master Enable/Disable, Multisite Monitor, and Multisite Logout Polling are selected from the System Options dialog box; each of these options are discussed in the following paragraphs. From the CEC/IMC Manager menu bar select Configure System / System Options / Multisite Settings to display the System Options dialog box.



Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

Save and Send

Choose the **Save and Send** button to save the new Multisite configuration to the CEC/IMC Manger hard disk drive and to send the new configuration to the CEC/IMC. Verification messages are displayed at the CEC/IMC Manager when the new configuration is saved to disk and when the CEC/IMC receives the Multisite configuration.

Read Disk

Choose the **Read Disk** button to view the current configuration stored at the CEC/IMC Manager hard disk.

Read CEC/IMC

Choose the **Read CEC/IMC** button to view the current Multisite configuration at the CEC/IMC.

Close

Choose the **Close** button to exit the System Options dialog box and return to the CEC/IMC Manager main window. If any changes have been made and not saved, you will be prompted (Write Changes to Disk?) to save and exit (**Yes**), exit without saving (**No**), or cancel the **Close** command and remain in the dialog box (**Cancel**).

Timer Master Enable/Disable

The Multisite Unit Logout check box in the System Options dialog box provides a master enable/disable function for **all** multisite unit timers. The timers at the MOM (Monitor Module) must be enabled if the timer-based multisite unit logout option is used. Enable the timers from this dialog box. With the Multisite Unit Logout check box selected (enabled), the multisite unit logout feature operates normally; a unit will be logged out from the multisite call routing process when its timer expires. If the Multisite Unit Logout check box is unselected (disabled), all multisite unit timers stop; therefore, a unit will not be logged out from the multisite call routing process as long as it remains logged into the EDACS trunked site.

Multisite Monitor

The Multisite Channel Monitoring function is available on a limited basis to prevent GSC bus overloading. If the average GSC loading is at an acceptable level, i.e. below the "entry" threshold, the MOM Controller will command all MIM type devices to begin putting secondary drops on the GSC bus. The CAM will intercept the secondary drops and send them to the CAL. The Network Manager will receive multisite channel monitoring information from the CAL and will use this information to display channel drops for secondary sites. Once this function is enabled, the MOM Controller will continue to monitor the GSC loading. If the average loading exceeds the "active" threshold, the MOM Controller will command all MIM type

devices to disable secondary drops. If the Multisite Channel Monitoring function is disabled, secondary drops will not be put on the GSC bus and the Network Manager will receive simulated secondary drops from the CAL.

Enable the Multisite Monitoring function by selecting (checking) the Multisite Monitor check box, unselect the check box to disable this function.

Multisite Logout Polling

If the Multisite Logout Polling function is enabled, prior to a timed logout timer expiration, a query will be transmitted to the unit about to be logged off of the system to verify that the unit is powered ON. If the unit is powered ON it will respond to the query and not be logged off; however, if the unit is OFF it will be logged off the system due to no response to the query.

Enable the Multisite Logout Polling function by selecting (checking) the Multisite Logout Polling check box, unselect the check box to disable this function.

3.21 WWVB TIME STANDARD CONFIGURATION

A coordinated universal time standard option is available that allows the CEC/IMC to be synchronized to WWVB in Fort Collins, Colorado. This option uses the Spectracom® Netclock/2™ WWVB receiver which interfaces to the CEC/IMC via a serial port at the CEC/IMC Manager (usually COM2). If the CEC/IMC is equipped with the WWVB option, the Netclock should be set up now.

Install, wire, and configure the hardware items as described in the Netclock documentation and Chapter 6. Special attention should be given to the section "Additional Considerations." When the Netclock/2 hardware has been installed and configured, install the Netclock/2 software on the CEC/IMC Manager according to the instructions in Chapter 6.

3.22 REDUNDANT CLOCK

Two identical but completely separate clock circuits—"A" and "B"—on each Clock Board provide redundant clocking capability for the CEC/IMC TDM bus circuits. Clock pulse outputs from both circuits are applied to the Audio Boards via the FUTUREBUS transceivers and

the Backplane. The MOM Controller Board controls clock selection by sending clock select command signals to all other Controller Boards within the CEC/IMC. Each Controller Board then controls the clock select circuitry on its respective Audio Boards.

NOTE

The redundant clock feature should only be enabled if the CEC/IMC is equipped with Audio Boards 19D903302P1 Rev. K (and later) and/or 19D903302P3. DO NOT enable the redundant clock feature if the CEC/IMC uses 19D903302P1 Rev. J or earlier Audio Boards.

If any of the selected clock pulses fail ("A" or "B" clock), clock monitoring circuitry on the Audio Boards signals their respective Controller Board. The informed Controller Boards then signal the MOM Controller Board, and if the redundant clock feature is enabled, the MOM Controller Board then commands all other Controller Boards in the CEC/IMC to switch their Audio Boards to the other clock circuit.

Redundant Clock Configuration

The initial start-up or default clock circuit is "B." If the MOM and two other Controller Boards report a "B" clock circuit problem, the MOM will switch clock operation to the "A" clock. Similarly, the MOM will also switch back to the "B" clock if a problem exists with the "A" clock. This redundant clock circuit selection can be enabled and disabled at the CEC/IMC Manager.

NOTE

If two or more Clock Boards are installed, corresponding clocks on the different Clock Boards should **never** be turned on ("A" and "A" for example). If only a single Clock Board is installed, both clocks should be turned on when the redundant clock feature is enabled ("A" and "B").

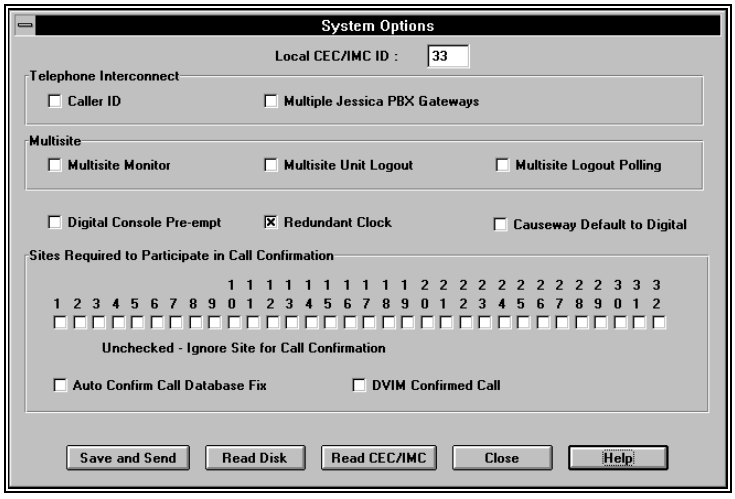
Panel-mounted toggle switches on the Clock Boards allow independent enable/disable control of the FUTUREBUS transceivers so multiple

Clock Boards can be installed. Generally, two Clock Boards are installed per CEC/IMC to allow uninterrupted operation when one Clock Board must be removed for servicing. If two Clock Boards are installed and the redundant clock feature is enabled, the toggle switches are normally set at the factory as follows.

- Clock Board 1: Clock "A" is turned off and clock "B" is turned on.
- Clock Board 2: Clock "A" is turned on and clock "B" is turned off.

With the toggle switches set in this manner, clock "B" on Clock Board 1 is the utilized clock when the CEC/IMC is powered-up. If a clock failure occurs the MOM will switch all Audio Boards to the "A" clock and the "A" clock on Clock Board 2 will become the utilized clock. Clock Board 1 can then be removed for service and the "B" clock on Clock Board 2 can be turned on using the panel-mounted toggle switch to maintain redundant clock operation.

If the redundant clock feature will be used, first verify the toggle switches on the Clock Boards are correctly set as described above. From the CEC/IMC Manager menu bar select Configure System / System Options / Redundant Clock to display the System Options dialog box. The redundant clock feature is enabled/disabled from the System Options dialog box.



Select the Redundant Clock check box to enable the redundant clock feature. Redundant Clock is set on a local CEC/IMC "systemwide"

basis from the CEC/IMC Manager. The Local CEC/IMC ID is displayed at the top center of the dialog box. Unselect the check box to disable this feature.

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

Save and Send

Choose the **Save and Send** button to save the new Redundant Clock configuration to the CEC/IMC Manger's hard disk drive and to send the new configuration to the CEC/IMC. Verification messages are displayed at the CEC/IMC Manager when the new configuration is saved to disk and when the CEC/IMC receives the Redundant Clock configuration.

Recovery From Improper Redundant Clock Enabling

If the CEC/IMC is equipped with the earlier Audio Boards (19D903302P1 Rev. J or before), the CEC/IMC may begin toggling between the two clock circuits if the Redundant Clock feature is enabled. Errors will be logged at the CEC/IMC Manager and audio problems will occur that may or may not be noticeable. The audio problems will be more noticeable in larger CEC/IMCs. If no backup clock is turned on during the clock toggles, distinct periods of good audio then no audio will occur as the CEC/IMC toggles between clock circuits. To restore correct operation if this feature is accidentally enabled with the earlier Audio Boards, perform one of the following procedures:

If Audio Boards Are Not Mixed:
(19D903302P1 up to Rev. J, no 19D903302P1 Rev. K or later, and no 19D903302P3 boards)

1. Turn all "B" clocks OFF at the Clock Boards. All clock-related LEDs on all Audio Boards (BCLK, SSYNC, FSYNC, 2175) should go out and stay out.
2. At the CEC/IMC Manager disable the redundant clock feature.
3. Turn one "B" clock ON. All clock LEDs on all Audio Boards should illuminate.

If Audio Boards Are Mixed:

1. At the CEC/IMC Manager disable the redundant clock feature.

2. If only one Clock Board is installed, turn both clocks ("A" and "B") ON using the panel-mounted toggle switches. If multiple Clock Boards are installed, turn OFF all but one "A" clock and turn OFF all but one "B" clock.

3. Clear the MOM Controller Board's non-volatile RAM (NOVRAM). This can be done as follows: Change the MOM Controller Board's DIP switches to a different interface module type (CIM or MIM for example), reset the Controller Board and wait at least three seconds. Change the DIP switches back to the MOM setting and reset the board again.

4. At the CEC/IMC Manager send TDM bus and slot assignments to the CEC/IMC.

5. Reset each Controller Board by pressing the reset switch on the front panel. If the CEC/IMC is equipped with firmware V5.0, this can be done automatically from the CEC/IMC Manager through Activate TDM Bus Slots from the CEC/IMC Configuration menu.

3.23 PROSOUND CONFIGURATION

When roaming on a wide area (multisite) network, ProSound enables a radio to select a new site based upon the bit error rate of the "adjacent" sites' control channels. The roaming operation is referred to as "wide area scan" or "wide area system scan." ProSound ensures the newly selected site's working channels will be sufficient to provide quality audio. During wide area scan operations, EDACS allows up to six adjacent sites to be scanned.

Without ProSound, the decision to wide area scan is based upon the bit error rate of the current control channel; three consecutive bad control messages will cause the radio to wide area scan. The non-ProSound wide area scan algorithm locks onto the first system it detects and validates, but this may not be the best quality signal in the available wide area (multisite) network. This method produces an extended coverage range beyond that of a working channel providing quality receive audio, and the radio operator receives lower quality audio during transition.

ProSound configuration involves sending each trunked site an updated "adjacency" matrix from the CEC/IMC Manager. This matrix is sent to the radio by the site and the radio uses it to make roaming decisions based on the relative bit error rates of the sites in the matrix. The

matrix includes one special site—the "priority system." The priority system is given an extra bit error rate threshold tolerance which favors the priority system during roaming operations. The threshold tolerance is programmed into the radio. ProSound configuration is done from the ProSound–Site Adjacency Configuration dialog box. From the CEC/IMC Manager menu bar select Configure System / System Options / ProSound to display the ProSound–Site Adjacency Configuration dialog box. The ProSound–Site Adjacency Configuration dialog box is shown in the following figure (Figure 43).

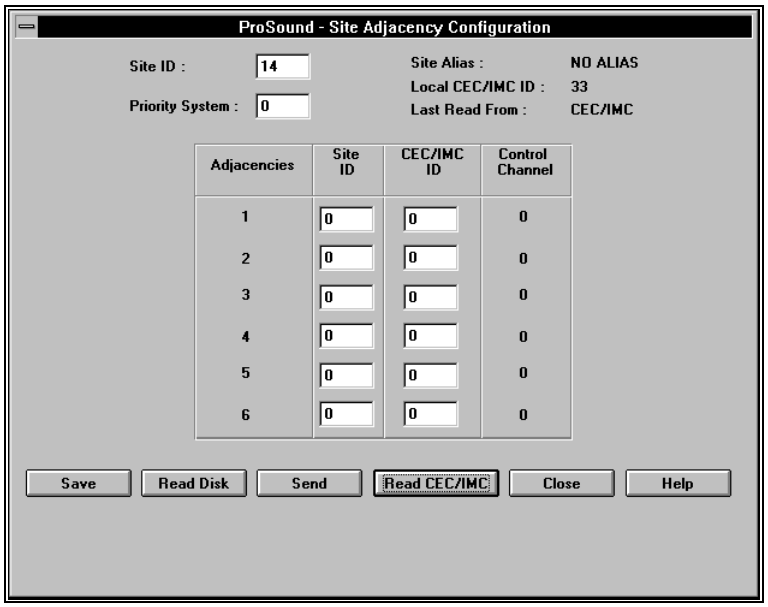


Figure 43 ProSound-Site Adjacency Configuration Dialog Box

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

ProSound Configuration

The ProSound configuration process is select the site, enter the necessary data, and then send and save this new ProSound configuration data to the site and the CEC/IMC Manager hard disk.

Repeat the sequence for all necessary sites. A more detailed description of the fields and configuration process follows.

NOTE!!

The CEC/IMC ID ("switch assignment number") must be set at the MOM Controller Board before ProSound will operate correctly. The CEC/IMC firmware automatically displays a CEC/IMC ID number even if one is not set at the MOM, so a displayed CEC/IMC ID does not guarantee that the switch assignment number has been set. Ensure this switch assignment number has been set by the DIP switches on the MOM Controller Board as specified in the ProSound section of LBI-38938, *CEC/IMC Digital Audio Switch Installation, Set Up, and Troubleshooting*.

Site ID (read/write)
Site ID number. Range = 1 – 32. Enter the site ID number for the site to be configured for ProSound operation in this field and then press **Enter**. When pressing **Enter** all other fields on the screen will update in accordance with the current ProSound database configuration saved on the CEC/IMC Manager's hard disk drive. This number matches the MIM site assignment number set by the DIP switches on the MIM Controller Board.

Site Alias (read only)
Alias of currently selected site. This name is defined at the System Manager.

Priority System (read/write)
Priority site ID number for the currently selected site. Range = 1 – 32. If a "0" is displayed, the priority system has not been defined. Enter the priority system's site ID number in this field.

Local CEC/IMC ID (read only)
The CEC/IMC switch assignment number for the currently selected site is displayed in the field. Range = 33 - 64.

Last Read From (read only)
This field indicates the source of the last update of the ProSound configuration, whether from the CEC/IMC Manager hard disk or the CEC/IMC.

Read Disk

Choose the **Read Disk** button to read the currently selected site's ProSound configuration from the CEC/IMC Manager's hard disk drive. This configuration may not be the same as the configuration at the CEC/IMC. A **Read Disk** followed by a **Send** will update the CEC/IMC configuration to match the CEC/IMC Manager configuration.

Read CEC/IMC

Choose the **Read CEC/IMC** button to read the currently selected site's ProSound configuration at the CEC/IMC. This is the actual configuration for the currently selected site. A **Read CEC/IMC** followed by a **Save** will update the CEC/IMC Manager hard disk configuration to match the CEC/IMC configuration.

Adjacencies (read only)
During wide area scan operations up to six possible adjacent sites can be scanned. This field displays the six adjacency site sequence numbers for the currently selected site.

Site ID (read/write)
This field defines the site ID numbers of the six possible adjacent sites, enter the adjacent site ID number. Leave the field set to "0" (default) if no adjacent site is present or if ProSound operation is not required at this site.

CEC/IMC ID (read/write)
This field defines the switch assignment numbers for the six possible adjacent sites. In each row enter the CEC/IMC switch assignment number ("node ID") for the adjacent site.

Control Channel (read only)
This field displays the control channels currently in use for each of the six possible adjacent sites. A "0" is displayed if the adjacent site has not been configured for ProSound operation.

Save and Send ProSound Configurations

Any new ProSound configuration must be sent to the CEC/IMC before it can take effect, also any new configuration sent to the CEC/IMC should be saved to the CEC/IMC Manager hard disk. This ensures that the current CEC/IMC configuration matches that stored on the CEC/IMC Manager hard disk. Like other configurations, the ProSound

configuration is saved at the CEC/IMC Manager server, typically local to the CEC/IMC; it is not saved at a remote client.

Save

Choose the **Save** button to save the new ProSound adjacency database information to the CEC/IMC Manger's hard disk drive.

Send

Choose the **Send** button to send the new configuration to the site via the CEC/IMC MIM control data link. A verification message is displayed at the CEC/IMC Manager when the site receives the ProSound configuration.

Close

Choose the **Close** button when finished with ProSound configuration to exit the ProSound–Site Adjacency Configuration dialog box and return to the CEC/IMC Manager main window. If any changes have been made and not saved, you will be prompted (Write Changes to Disk?) to save and exit (**Yes**), exit without saving (**No**), or cancel the **Close** command and remain in the dialog box (**Cancel**).

3.24 EXITING THE PROGRAM

To exit the CEC/IMC Manager program, select the CEC/IMC Manager control-menu box to display the control menu, then choose the Close command. The program can also be exited by double clicking on the CEC/IMC Manager control-menu box or pressing the **Alt**+**F4** keys. If data logging is enabled, this exit may take some time as the software writes the last bits of data to the data log buffer on the hard disk.

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4. CHAPTER 4
MONITOR SYSTEM

4.1 SYSTEM MONITORING

The CEC/IMC Manager for Windows NT system monitoring capabilities allow the CEC/IMC Manager user to monitor system performance starting from an overall global view all the way down to a board level. The various functions included within system monitoring are Node Data, Feature Data, Diagnostics, and Statistics. Select Monitor System from the CEC/IMC Manager menu bar to display the Monitor System menu choices.

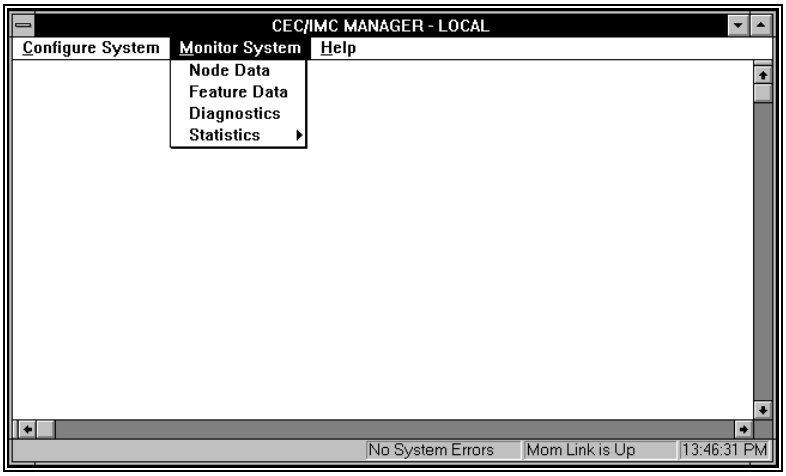

Figure 44 Monitor System Menu

4.2 NODE DATA

The Node Data function allows the user to view the total Controller Board (device) configuration of the CEC/IMC on a single screen. From the CEC/IMC Manager menu bar select Monitor System / Node Data to display the Node Matrix screen, labeled CEC/IMC Diagnostics.

4.2.1 Node Matrix

The Node Matrix screen contains a 16 x 16 matrix of all possible hexadecimal GSC node addresses in the system.

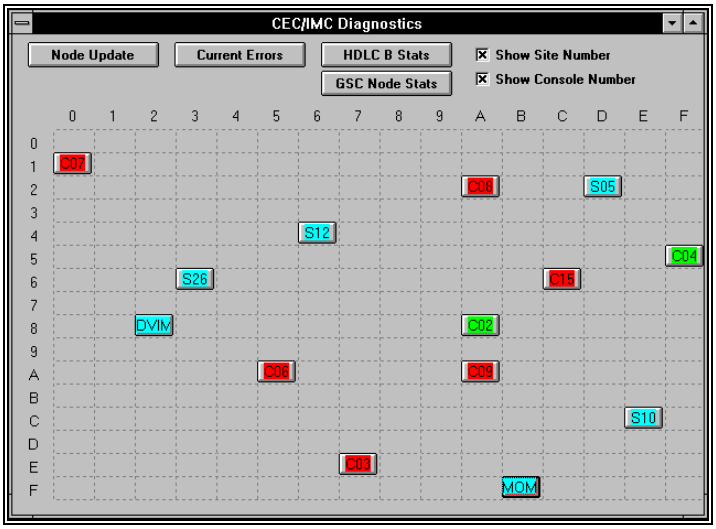

Figure 45 CEC/IMC Diagnostics (Node Matrix) Screen

Press the **F1** key to access the Help function.

The available addresses are the range 00h to EFh and FBh, which is the permanent address of the MOM Controller Board. F0h thru FAh and FCh thru FFh are reserved and cannot be accessed. Each installed device in the system is represented by a colored "node" with the device type displayed on the node. The meaning of the node colors are as follows:

- Blue - the device Link State is UP
- Red - the device has a failed Control Link
- White - the device Link State is UP, but other errors exist
- Yellow - the device (MIM or NIM) is active but the corresponding site is in a Failsoft condition
- Green - indicates that the device is a CIM and that the CIM is active with Link State UP

Show Site Number
Select this check box to display the site assignment number of the site-type interface modules as shown above. If this check box is unselected the interface module type (MIM, NIM, etc.,) will be displayed in place of the site assignment number.

Show Console Number
Select this check box to display the console assignment of the CIMs as shown above. If this check box is unselected "CIM" will be displayed in place of the console assignment number.

Some nodes, such as XLTR, LRIM, DVIM, and MOM, will not display any assignment numbers when either of the above check boxes are selected. Selecting (single-click) any of the nodes will display current device and board identification data as described in Board Identification below.

Press the **Esc** key to exit this screen and return to the CEC/IMC Manager main window.

"Hot Buttons"

Node Update

Choose the **Node Update** button to update the GSC Node database from the MOM Controller Board.

Current Errors

Choose the **Current Errors** button to display the Active Devices dialog box, double-click on the desired device to display the Diagnostics dialog box with the Current Errors option selected.

HDLC B Stats

Choose the **HDLC B Stats** button to display the Active Devices dialog box, double-click on the desired device to display the HDLC Statistics Channel B dialog box.

GSC Node Stats

Choose the **GSC Node Stats** button to display the Active Devices dialog box, double-click on the desired device to display the Node Statistics dialog box.

4.2.2 Board Identification

Selecting (single-click) any of the nodes will display the Board Identification dialog box shown below. The information in the upper half of this dialog box—Node ID, Type, Version, Assignment, and Error(s)—is a "snapshot" of the node when selected, it **does not update** to reflect any changes that may occur while viewing this dialog box.

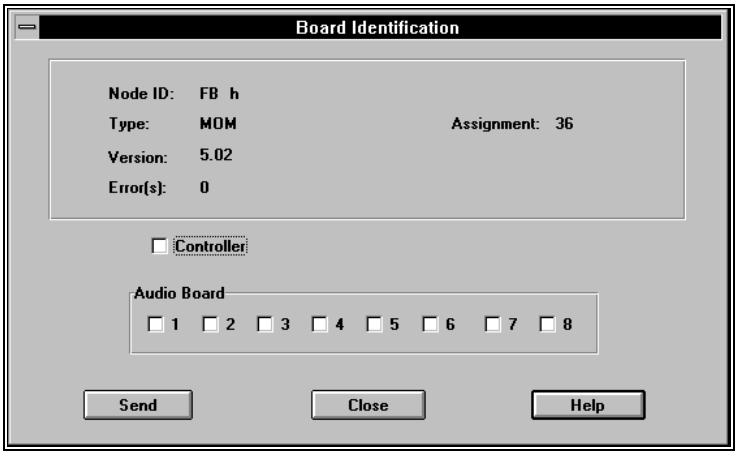

Figure 46 Board Identification Dialog Box

Help

Choose the **Help** button to access the Help function. (Help can also be accessed by pressing the **F1** key.)

Close

Choose the **Close** button to exit the Board Identification dialog box and return to the CEC/IMC Diagnostics (Node Data) screen.

Send

Choose the Send button to cause the ID LEDs of those boards selected in the Board Identification dialog box to begin flashing at the CEC/IMC.

Current Node Data

The upper half of the Board Identification dialog box contains the information listed below about the selected interface module (device).

Node ID
This field displays the current hexadecimal GSC address.

Type
This field displays the interface module type: MIM, MOM, etc.

Assignment
This field displays the setting of the interface module's Controller Board dip switches (site assignment number).

Version
This field displays the major and minor version number of the 80C186 software installed in the interface module. Since the version number was not coded into Controller Boards prior to version 2.00, any previous versions (1.00 thru 1.10) of software installed will have "????" displayed in this field.

Error(s)
This field displays the number of errors affecting the interface module when selected. This count will include errors that affect only the current interface module plus the number of global system errors. In some cases the sum of all the values displayed in this field for each individual interface module will be greater than the value displayed in the System Errors field. This will occur whenever a global system error currently exists, each global system error is counted as a single error in the System Errors field and is also counted as a single error in each individual interface module error count. As mentioned previously, this information **does not update** while viewing this dialog box.

Board Identification Data

The lower half of the Board Identification dialog box contains check boxes for the Controller Board and Audio Boards of the selected interface module. A MIM may have a second, backup, Controller Board, all other modules will have only one. Select a board and follow with a **Send** to cause the selected board's ID LED to begin flashing immediately. Any board that was unselected will be sent a message clearing its ID LED, if the ID LED was previously flashing it will now turn off. Choose **Close** to exit this dialog box and turn off all ID LEDs on boards associated with this interface module.

4.3 FEATURE DATA

This function displays the Licensed Features and Licensed Capabilities for your particular CEC/IMC. Select Feature Data from the Monitor System menu to display the IMC Feature Data screen.

Starting with Group 12, CEC/IMC software will require licenses to specify the operational features and maximum capacities for a CEC/IMC system. With license controlled features a customer will be able to pay for only the features and capacities required for a particular installation. The customer will also be able to receive software upgrades that contain desired problem resolutions, without having to pay for any undesired new features in the upgrade.

Each licensed feature or capacity for a CEC/IMC requires that a license be obtained from Ericsson customer support. Note that the licensed features and capabilities may be different than the maximum capabilities of the CEC/IMC. The licenses must be installed at the CEC/IMC Manager PC for the desired features/capacities to take effect, and cannot be changed by the end user. For information on upgrading current licenses or obtaining new licenses, contact an Ericsson customer support representative.

A CEC/IMC License may be obtained with a limited duration. This is useful for customers who wish to try a licensed feature before purchasing it. CEC/IMC Warnings will be issued before the license expires, and a system error will be displayed if the license expires. The licensed feature will not actually be disabled until the CEC/IMC Manager for Windows NT is stopped and restarted. This is to allow the customer time to obtain any required licenses before a used feature is disabled.

- Pending License expiration warnings are issued for any license that will expire within 30 days.
- Invalid feature data system error is issued if no license data is available.
- Expired License error is issued if a license expires while the CEC/IMC Manager is running.

For more information concerning the administration of product licenses see *EDACS® Product Licenses for Windows NT® Administration Guide* (AE/LZT 123 1906 R1A).

Close

Choose the **Close** button to exit the IMC Feature Data screen and return to the CEC/IMC Manager main window.

4.3.1 Licensed Features

Failsoft Patch
This license allows the customer to perform console dispatch patch operations when the system is in Trunked Failsoft operation. A CEC/IMC that is connected to an EDACS basic Failsoft site will be in Trunked Failsoft mode. This feature requires GETC software that supports Failsoft patch and C3 Maestro software 4.0 or later to operate correctly. Leaving this feature disabled at the CEC/IMC is an effective means of preventing Failsoft patch attempts on a system that does not have Failsoft patch capable software at all sites. Patch attempts will be denied consistently until all sites are upgraded, then the license can be installed to enable the feature. This feature is enabled if the check box is selected.

Landline Data
A customer must have this license in order to install an Ericsson Data Gateway (EDG) product in the CEC/IMC. This license is not required for radio to radio RF Data. This feature is enabled if the check box is selected.

Landline Digital
This license allows a customer to perform MultiSite Aegis or Voice Guard calls. This feature also requires DVIM/DVIU channels, StarGate controller, multiple sites capable of digital calls, conventional interface, and at least two digital capable radios and consoles to perform Digital Dispatch or Digital Interconnect calls. Single site radio to radio Aegis or Voice Guard calls do not require a license. This feature is enabled if the check box is selected.

4.3.2 Licensed Capacities

MSC Type
The CEC/IMC may be ordered in several different base configurations for different purposes (CEC or IMC for example). This license is used by the software to determine the current node configuration for CEC/IMC type specific processing. The license must match the ordered node type for all features to operate properly. The node type controller that the CEC/IMC Manager is connected to is indicated by the following table.

Table 11 Licensed MSC Type

License Value	MSC Type	Description
0	IMC	Default value if license is not present, multiple site interface
1	CEC	Dispatch Console interface to single trunked site
2	StarGate	StarGate controller in StarGate Network
3	Remote CEC	Console Only interface, used to remotely connect multiple dispatch consoles to a CEC or IMC

Max Sites
This license specifies the number of MIMs (Site interfaces) that can be configured in the CEC/IMC. The value may range from 1 to 32.

Max Consoles
This license specifies the number of CIMs (Console interfaces) that can be configured in the CEC/IMC. The value may range from 1 to 32.

Max Network
This license specifies the number of NIMs (Network interfaces) that can be configured in the CEC/IMC. The value may range from 1 to 8. This license applies to StarGate interfaces and Remote CEC interfaces. The following license (Min Remote CEC) is also required to specify which type of Network interfaces are desired

Min Remote CEC
This license specifies the number of Remote CEC NIMs required in the CEC/IMC. The value may range from 0 to 8. Beyond this limit StarGate NIMs may be configured up to the previous license limit (8).

Max Causeway
This license specifies the maximum number of Causeway (hard) Patch/Simulselects allowed for the CEC/IMC.

Max Site Chan
This license specifies the number of CEC/IMC TDM Bus slots that are required for MIM devices. Each site channel requires an allocated TDM Bus slot to be used for wide area or console dispatch calls.

Max Net Chan
This license specifies the number of CEC/IMC TDM Bus slots that are required for NIM devices. Each NIM channel (StarGate or Remote CEC NIM) requires an allocated TDM Bus slot.

4.4 DIAGNOSTICS

The Diagnostics function of the CEC/IMC Manager enables the user to generate reports about Errors, current and logged (past), Warnings, Calls Translation, GSC Monitor Data, and GSC Translation on a "global" level or for each active device (interface module) within the CEC/IMC. Select Diagnostics from the Monitor System menu to enter the Diagnostics function. The first dialog box displayed will be the Active Devices dialog box which lists all active interface modules. When a device is selected from this dialog box the various diagnostic options for that device become available.

Active Device Selection

The Active Devices dialog box contains the Active Site Selection List which is a listing of all active interface modules (devices). Select a "device" (only one may be selected at a time) from this list, then choose the **OK** button to display the Diagnostics dialog box. Choose the **Close** button to exit system monitoring and return to the CEC/IMC Manager main window.

Figure 47 Active Devices Dialog Box

4.4.2 Diagnostic Options

Select the report option to view from the Selection field of the Diagnostics dialog box. The options are Errors (option of logged or current, available when Errors is selected), Warnings, Call Translation, GSC Data, and GSC Translation. Each of these options is discussed in detail in the following sections.

The time range of the report for the selected option is specified in the Range field. This time entry must be in the format "HH:MM:SS (space) XM (space) MM/DD/YY" (twelve hour format, AM or PM). Any other format may produce unexpected results.

The Status field displays the number of records that have been received by the CEC/IMC Manager for the selected report after the **Display** command has been initiated.

Press the **F1** key to access the Help function.

Close

Choose the **Close** button to exit the Diagnostics dialog box and return to the Active Devices dialog box.

Display

Choose the **Display** button to display the selected report in the Diagnostics dialog box. This information can be sent to a file or to a printer by choosing the **Save To File** or **Print** buttons respectively.

Save To File

Choose the **Save To File** button to print the entire selected report to a file for later viewing or printing. A report must be displayed (**Display** button) before it can be saved to a file.

Print

Choose the **Print** button to print the entire selected report directly to the connected printer (if one is connected). A report must be displayed (**Display** button) before it can be printed.

View Errors (Current and Logged)

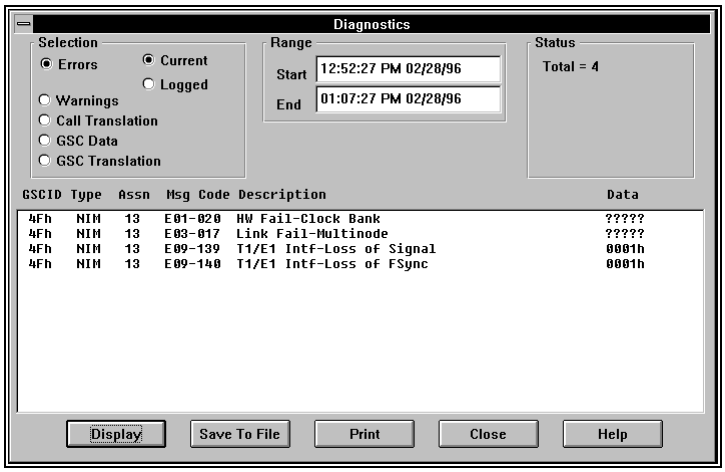

Figure 48 Diagnostics Dialog Box, Errors Option Selected

There are two types of error reports available: errors that currently exist and logged errors over a user-specified time interval. Each report entry details the source of the error, the related message code number, and a short description. The only difference between the two reports is that for logged errors the date and time of the error is reported.

– The GSC address (GSCID), device type (Type), and device assignment (Assn) columns provides the user with an exact

location of the error's source. In the case of a global system error, the text "GLOBAL SYSTEM" will be displayed across these 3 columns, since this type of error affects all interface modules (devices/nodes). Global system errors are included in all existing error reports, whether it is a single node, all sites, all consoles, or all nodes report. Global system errors are not included in logged (past) error reports.

– The message code number is used as a reference to obtain further information on the reported error. It consists of a single alphabet character followed by 2 numeric values separated by a "-". The character "E" refers to an error message code. The first numeric value specifies the class of error, such as a bus failure, or a communications link failure. The second numeric value is the type of entity to which the error refers, such as the GSC bus, or the CEC/IMC Manager. The short description following the message code reflects this format. For example: E03-028 "Link Fail-Console."

– All current possible errors are listed by message code number in this dialog box's Help function. In most instances the short description given will provide enough information to indicate the reason for the error.

It is important to note the existing error report dialog box is not updated if the system error status changes. To generate a new report, this dialog box must be exited and re-entered.

To create an Errors report select the Errors option button and then either the Current or Logged option button. Choose the **Display** button to display the Errors file. The Errors information can be sent to a file or to a printer by choosing the **Save To File** or **Print** buttons respectively.

View Warnings

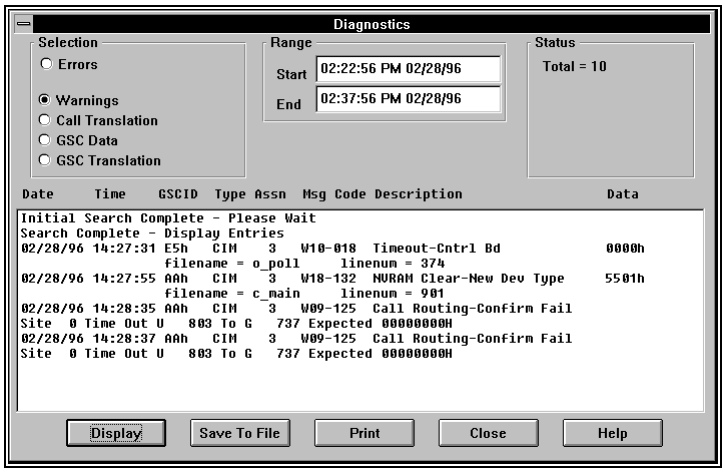

Figure 49 Diagnostics Dialog Box, Warnings Option Selected

Each entry in the report consists of two lines of information detailing the time and source of the warning, the related message code number, a short description, a data value, and the source filename and line number where the warning was issued.

- The date and time indicates when the warning was received by the CEC/IMC Manager and is the same as the time of occurrence. Unlike errors, warning messages are not acknowledged by the CEC/IMC Manager. If the warning message does not reach the CEC/IMC Manager, it is not re-transmitted.
- The GSC address (GSCID), device type (Type), and device assignment (Assn) columns provide the user with an exact location of the warning's source. Unlike errors, there are no global system warnings.
- The message code number is used as a reference to obtain further information on the warning being reported. It consists of a single alphabet character and 2 numeric values separated by a "-". The character "W" refers to a warning message code. The first numeric value specifies the class of warning, such as an out-of-range value, or unsupported message group value. The second numeric value is the type of entity to which the warning refers, such as an audio channel, or a message group.

The short description following the message code reflects this format. For example: W02-033 "Out of Range-Audio Channel."

- All possible warnings are listed by message code number in this dialog box's Help function. In most instances the short description given will provide enough information to indicate the reason for the warning.
- The data field usually contains the value that caused the warning to be issued. See the description for the particular message code in the Help function for further details.
- The second line of the entry displays the source code filename and line number where the warning was generated. This is used mainly for debugging potential code data flow problems.

To create a Warnings report select the Warnings option button in the Selection field, then choose the **Display** button to display the Warnings file. The Warnings information can be sent to a file or to a printer by choosing the **Save To File** or **Print** buttons respectively.

Call Translation

The Call Translation option is accessible from the Diagnostics Options menu. This option allows the user to display the CEC/IMC Manager datalog information with a filter so only messages related to call traffic are displayed. In addition, the displayed messages are translated from a hexadecimal format to a more readable format. A typical Call Translation screen is shown below.

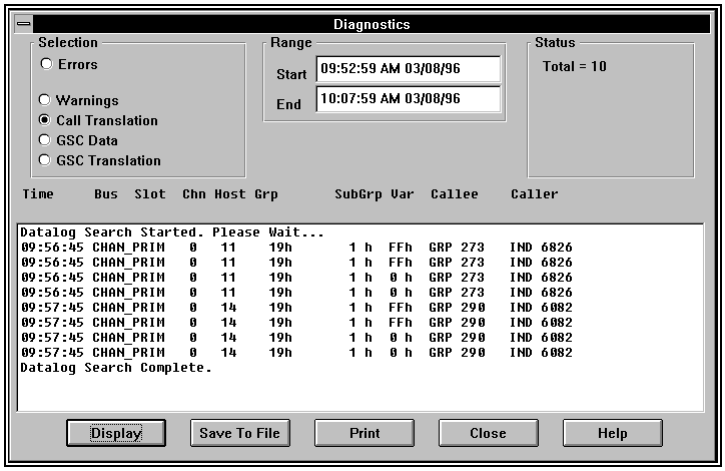

Figure 50 Diagnostics Dialog Box, Call Translation Option Selected

Information displayed by this on-line option is identical to the information displayed by the off-line CALLS.EXE program described in Chapter 5 of this manual. See Chapter 5 or the on-line Help function for message group and sub-group definitions.

NOTE

The buffer at the MOM controller will wait until it is about 65% full before writing to the data log file. This could mean a delay of up to 5 minutes between keying a call and the call showing up in the data log.

To create a Call Translation report select the Call Translation option button and enter date and time ranges in the appropriate text box, then choose the **Display** button to display the datalog file. Since the datalog file may be quite large, it could take several minutes to finish a translation. The Call Translation information can be sent to a file or to a printer by choosing the **Save To File** or **Print** buttons respectively.

GSC Data

This option is also accessible from the Diagnostics Options menu. It allows the user to view the CEC/IMC Manager datalog information in a raw hexadecimal format. A typical GSC Data screen is shown below.

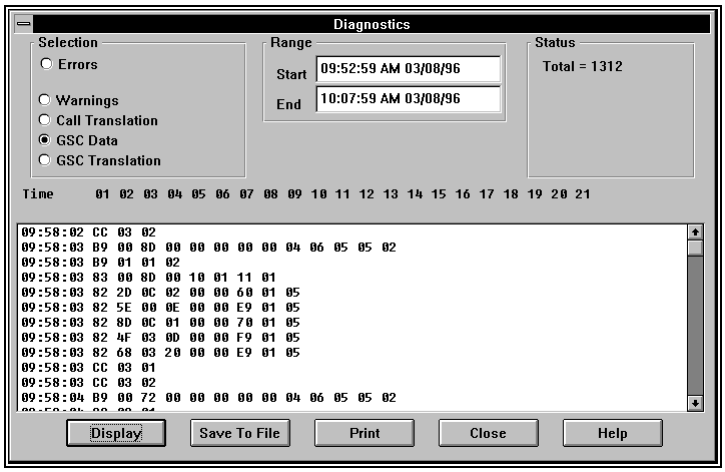

Figure 51 Diagnostics Dialog Box, GSC Data Option Selected

Once displayed, this information can also be sent to a file or printed. This on-line option is similar to the off-line GSCMOM.EXE program described in Chapter 5 of this manual.

NOTE

The buffer at the MOM controller will wait until it is about 65% full before writing to the data log file. This could mean a delay of up to 5 minutes between keying a call and the call showing up in the data log.

To create a GSC Data report select the GSC Data option button and enter date and time ranges in the appropriate text box, then choose the **Display** button to display the datalog file. Since the datalog file may be quite large, it could take several minutes to finish a translation. The GSC Data information can be sent to a file or to a printer by choosing the **Save To File** or **Print** buttons respectively.

GSC Translation

This option, also accessible from the Diagnostics Options menu, is similar to the GSC Data option except there is an attempt to translate the messages into a more readable format. This is similar to the Call Translation option, except no messages are filtered out. Messages that cannot be translated are left in the raw hex form. A typical screen is shown below. Note the header for this option is identical to the Call Translation header since many messages fall into the same format.

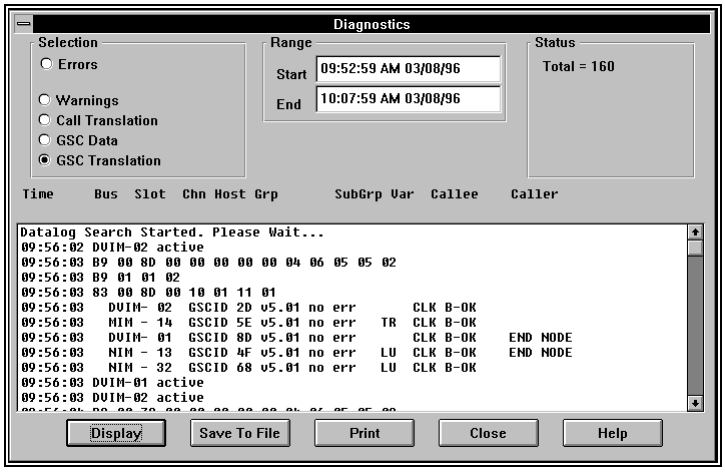

Figure 52 Diagnostics Dialog Box, GSC Translation Option Selected

GSC Translation should be used when it is desired to view switch/site status while tracing a problem call if the approximate time is known, for example: Failsoft state at time of call. This is recommended since even a very low traffic CEC/IMC will generate more than 3000 messages in a 15-minute period under these conditions.

NOTE

The buffer at the MOM controller will wait until it is about 65% full before writing to the data log file. This could mean a delay of up to 5 minutes between keying a call and the call showing up in the data log.

To create a GSC Translation report select the GSC Translation option button and enter date and time ranges in the appropriate text box, then choose the **Display** button to display the datalog file. Since the datalog file may be quite large, it could take several minutes to finish a translation. The GSC Translation information can be sent to a file or to a printer by choosing the **Save To File** or **Print** buttons respectively.

4.5 STATISTICS

The Statistics function allows real time viewing of quantitative data related to various devices within the CEC/IMC. There are currently six types of statistics available for viewing: HDLC Channel A, HDLC Channel B, GSC Node, MOM Serial HDLC, NIM, and TEC (T1/E1 Interface Card). These statistics may be viewed for active devices only.

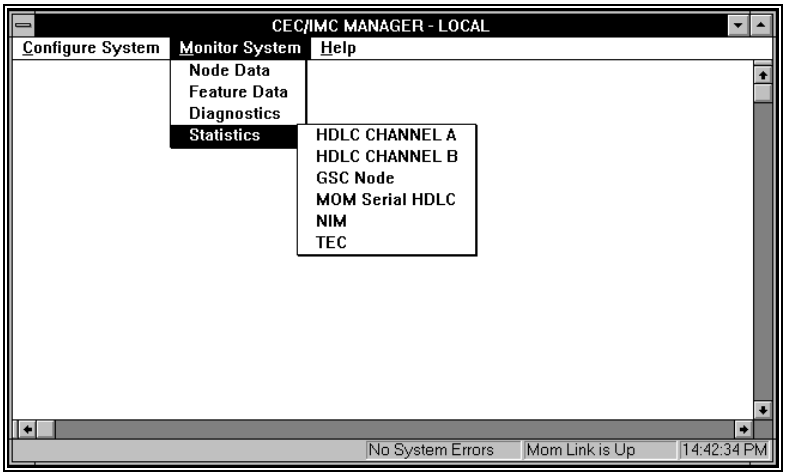

Figure 53 Monitor System Statistics Menu

4.5.1 HDLC Statistics

The HDLC STATISTICS dialog box displays data in real-time about HDLC channel A, the high-speed synchronous communications link from the CEC/IMC to an external device such as a CAL computer; HDLC channel B, used for communications between Controller Board and Audio Boards; or MOM Serial HDLC, used for communications between the MOM Controller Board and CEC/IMC Manager (MOM PC).

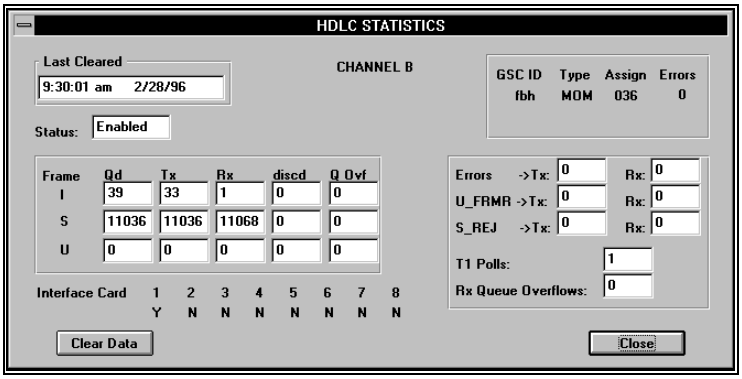

Figure 54 HDLC (Channel B) Statistics Dialog Box

Press the **F1** key to access the Help function.

Clear Data

Choose the **Clear Data** button to reset the data display and allow a refresh of the display. All counts are from the last reset.

Close

Choose the **Close** button to exit the HDLC STATISTICS dialog box and return to the Active Devices dialog box.

Last Cleared
Displays the time and date of the last **Clear Data** command.

GSC ID
Displays the current hexadecimal GSC address.

Type
Displays the interface module type: MIM, MOM, etc.

Assign
Displays the setting of the interface module's Controller Board dip switches (site assignment number).

Errors
Displays the number of errors currently existing that affect the selected interface module. This count will include errors that affect only the current interface module plus the number of global system errors. In some cases the sum of all the values displayed in this field for each individual interface module will be greater that the value displayed in the System Errors field. This will occur whenever a global system error currently exists, each global system error is counted as a single error in

the System Errors field and is also counted as a single error in each individual interface module error count.

Status
Indicates whether the current channel is enabled or disabled (HDLC A and B only). If disabled, no communications are possible on the channel. This field is not applicable for the MOM Serial HDLC.

Frame
Describes the HDLC protocol frame type, either I, S, or U.

Qd
A count of I, S, or U frames placed in the respective transmit queue.

Tx
A count of I, S, or U frames copied from the respective transmit queue to the HSCX chip transmit FIFO.

Rx
A count of valid I, S, or U frames received, where a valid frame is defined as one in which the HSCX chip receive status (RSTA) register contains the following bit values:

VFR = 1 (valid frame received)
CRC = 1 (CRC check OK)
RAB = 0 (received frame not aborted from transmitting station)

discd
A count of received I, S, or U frames discarded due to the following:

I-frames – N(R) or N(S) error, address byte indicated a response (I-frames are always commands), or station in a state that doesn't accept I-frames.

S-frames – N(R) error, unrecognized command/response, or station in a state that doesn't accept S-frames.

U-frames – unrecognized command/response, address byte indicated a command for a response, or vice-versa.

Q Ovf
A count of I, S, or U frames lost due to transmit queue full condition.

Errors Tx
A count of all frame types that had to be re-transmitted due to an XMR (Transmit Message Repeat) interrupt from the HSCX chip.

Errors Rx
A count of invalid frames received, where an invalid frame is defined as one in which the HSCX chip receive status (RSTA) register contains one or more of the following bit values:

VFR = 0 (invalid frame received)
CRC = 0 (CRC check failed)
RAB = 1 (received frame was aborted from transmitting station)

U_FRMR Tx/Rx
A count of U-frame FRMR (frame reject) responses transmitted and received.

S_REJ Tx/Rx
A count of S-frame REJ commands/responses transmitted and received.

T1 Polls
A count of polls issued to the remote station due to its failure to acknowledge an I-frame, U-frame command, or polled S-frame command within a given time limit. For channel B, this count also includes the number of polls issued to all remote stations when no messages have been transferred over the link after a given time interval.

Rx Queue Overflows
A count of received frames lost due to a full receive queue condition.

HDLC Channel B
In addition to the fields described above, the Channel B HDLC statistics screen also contains information on up to eight Audio Boards or T1/E1 Interface Cards (TEC) that may be assigned to the current Controller Board. These fields display "Y" to indicate an active Audio Board or TEC (a response is being received via the HDLC link), or "N" to indicate an inactive Audio Board or TEC (no response is being received via the HDLC link).

4.5.2 GSC Node Statistics

The (GSC) NODE STATISTICS dialog box displays various interface module specific data.

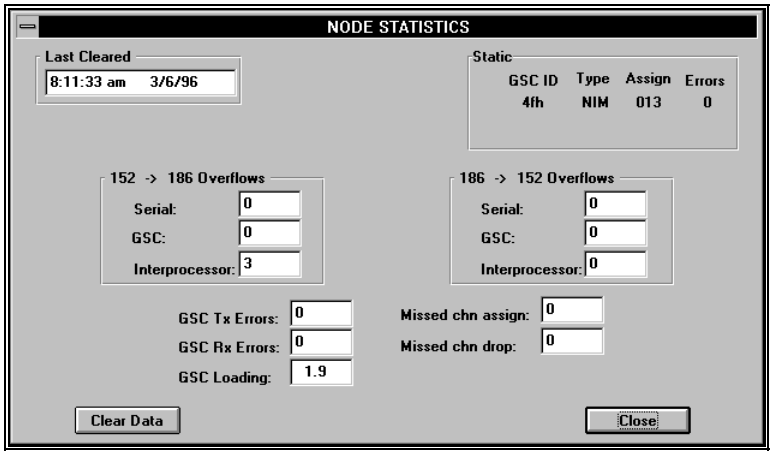

Figure 55 GSC Node Statistics Dialog Box

Press the **F1** key to access the Help function.

Clear Data

Choose the **Clear Data** button to reset the data display and allow a refresh of the display. All counts are from the last reset.

Close

Choose the **Close** button to exit the NODE STATISTICS dialog box and return to the Active Devices dialog box.

Last Cleared
Displays the time and date of the last **Clear Data** command.

GSC ID
Displays the current hexadecimal GSC address.

Type
Displays the interface module type: MIM, MOM, etc.

Assign
Displays the setting of the interface module's Controller Board dip switches (site assignment number).

Errors
Displays the number of errors currently existing that affect the selected interface module. This count will include errors that affect only the current interface module plus the number of global system errors. In some cases the sum of all the values displayed in this field for each

individual interface module will be greater that the value displayed in the System Errors field. This will occur whenever a global system error currently exists, each global system error is counted as a single error in the System Errors field and is also counted as a single error in each individual interface module error count.

Dual Port Buffer Overflows
The number of times the dual port buffer is full when an attempt is made to place a message in the buffer. Statistics are shown for overflows for the following messages:

152 ⇒ 186 Overflows:

Serial – data received from 80C152 serial port for 80C186 processing.

GSC – data received from 80C152 GSC for 80C186 processing.

Interprocessor – internal 80C152 message for 80C186 processing.

186 ⇒ 152 Overflows:

Serial – data the 80C186 wishes to transmit out the 80C152 serial port.

GSC – data the 80C186 wishes to transmit onto the 80C152 GSC.

Interprocessor – internal 80C186 message for 80C152 processing.

GSC Tx errors
A count of transmit error interrupts received on the 80C152.

GSC Rx errors
A count of receive error interrupts received on the 80C152.

GSC Loading
A measurement of loading for the effective bandwidth. When 27% loading on the total GSC bandwidth is the maximum due to excessive collisions, this will be displayed as 100% loading of effective bandwidth.

Missed chn assign (MIM-type devices only)
A count of channel assignments received by MIM/VMIM/etc. on a channel the MIM/VMIM/etc. currently has marked as active.

Missed chn drops (MIM-type devices only)
A count of channel drops received by the MIM/VMIM/etc. on a channel on which the MIM/VMIM/etc. has no activity.

4.5.3 NIM Statistics

The NIM STATISTICS dialog box displays various NIM data. The data is updated continuously (about once per second) while the screen is displayed.

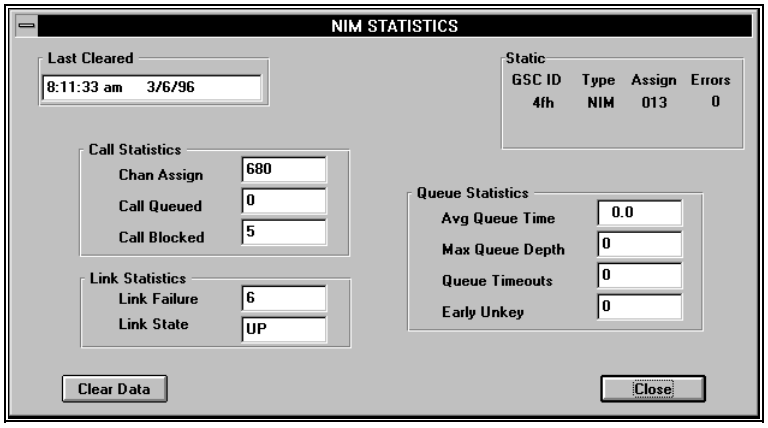

Figure 56 NIM Statistics Dialog Box

Press the **F1** key to access the Help function.

Clear Data

Choose the **Clear Data** button to reset the data display and allow a refresh of the display. All counts are from the last reset.

Close

Choose the **Close** button to exit the NIM STATISTICS dialog box and return to the Active Devices dialog box.

Last Cleared
Displays the time and date of the last **Clear Data** command.

GSC ID
Displays the current hexadecimal GSC address.

Type
Displays the interface module type: MIM, MOM, etc.

Assign
Displays the setting of the interface module's Controller Board dip switches (site assignment number).

Errors
Displays the number of errors currently existing that affect the selected interface module. This count will include errors that affect only the current interface module plus the number of global system errors. In some cases the sum of all the values displayed in this field for each individual interface module will be greater that the value displayed in the System Errors field. This will occur whenever a global system error currently exists, each global system error is counted as a single error in the System Errors field and is also counted as a single error in each individual interface module error count.

Call Statistics

Chan Assign
Indicates the number of calls routed over the NIM interface since the last **Clear Data** command.

Call Queued
Indicates the number of call attempts queued due to no channel available since the last **Clear Data** command.

Call Blocked
Indicates the number of call attempts blocked, no equipped channels or queue full since the last **Clear Data** command.

Queue Statistics

Avg Q Time
Indicates the average waiting time of the last four queued calls (may be less than four depending upon length of time since the last **Clear Data** command).

Max Q Depth
Indicates the maximum number of simultaneous queued call attempts since the last **Clear Data** command.

Early Unkey
Indicates the number of instances the call originator unkeyed while the call was still queued since the last **Clear Data** command.

Link Statistics

Link Failure
Indicates the number of control link failures accumulated at the CEC/IMC Manager since the last **Clear Data** command.

Link State
Indicates the current control link state (UP or DOWN) between the selected NIM and any networks NIMs. If the link state is DOWN this field does not indicate at which end of the link the problem exists.

4.5.4 TEC (T1/E1 Interface Card) Status and Statistics

The T1/E1 Card Status and Statistics dialog box displays various information about any T1/E1 Interface Cards that may be installed in the CEC/IMC.

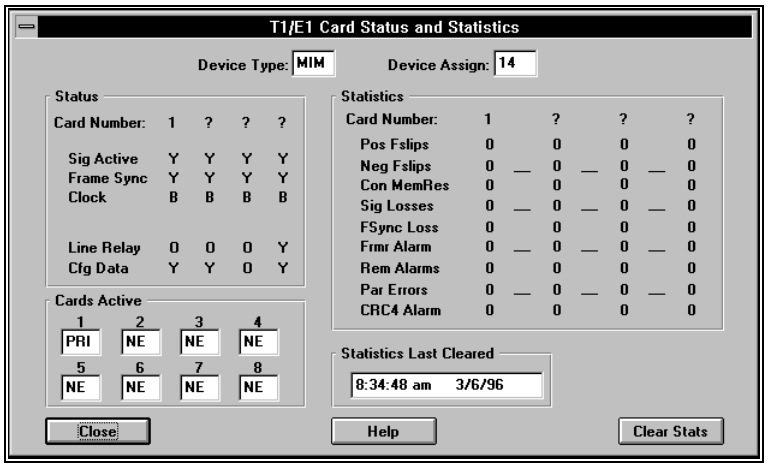

Figure 57 T1/E1 Card Status and Statistics Dialog Box

Help

Choose the **Help** button to access the Help function. (Help is also available by pressing the **F1** key.)

Clear Stats

Choose the **Clear Stats** button to reset the data display and allow a refresh of the data to be displayed. All counts are from the last reset.

Close

Choose the **Close** button to exit the T1/E1 Card Status and Statistics dialog box and return to the Active Devices dialog box.

Device Type
This field displays the interface module type: MIM, NIM, etc. (currently only MIMs, NIMs, and PIMs can be equipped with T1/E1 Interface Cards).

Device Assign
This field displays the setting of the interface module Controller Board dip switches (site assignment number).

Status

Card Number
This field indicates which (active) cards within the interface module the subsequent data fields reference. Each interface module will eventually be able to support up to eight (currently only one) T1/E1 Interface Cards, with only four cards active at any given time (See Cards Active below.).

Sig Active
This field indicates if a T1/E1 signal is being received. If the T1/E1 Interface Card detects a T1/E1 signal being received this field will be "Y," and "N" if not. At the T1/E1 Interface Card LED DS5 (labeled "SIG") will also be illuminated if this field is "Y."

Frame Sync
This field indicates if frame synchronization exists. If the T1/E1 Interface Card detects a valid T1/E1 receive framing sequence this field will be "Y," and "N" if not. At the T1/E1 Interface Card LED DS6 (labeled "SYNC") will also be illuminated if this field is "Y."

Clock
This field indicates which system clock (A/B) is providing the clocking function for the card.

Line Relay
This field will be used to indicate redundancy status in later code releases.

Cfg Data
This field indicates if configuration data exists for the card (Y/N). If the T1/E1 Interface Card has received a database this field will be set to "Y," and "N" if not.

Statistics

Card Number
This field indicates which (active) cards within the interface module the subsequent data fields reference. Each interface module will eventually be able to support up to eight (currently only one) T1/E1 Interface Cards, with only four cards active at any given time (See Cards Active below).

Pos Fslips
This field indicates the number of Positive Frame Slips accumulated at the CEC/IMC since the last **Clear Stats** command or the last TEC reset. A Positive Frame Slip occurs when a clocking frequency mismatch (at the card level) causes received frames to be repeated.

Neg Fslips
This field indicates the number of Negative Frame Slips accumulated at the CEC/IMC since the last **Clear Stats** command or the last TEC reset. A Negative Frame Slip occurs when a clocking frequency mismatch (at the card level) causes received frames to be discarded.

Con MemRes
This field indicates the number of Connection Memory Resets accumulated at the CEC/IMC since the last **Clear Stats** command or the last TEC reset. The Connection Memory stores input-to-output routing maps and thus controls the flow of audio and/or data signals on the T1/E1 Interface Card. A Connection Memory Reset will cause the TEC to issue a clock failure and be re-initialized by the Controller Board.

Sig Losses
This field indicates the number of "T1/E1 Interface-Loss of Signal" errors accumulated at the CEC/IMC since the last **Clear Stats** command or the last TEC reset.

Fsync Loss
This field indicates the number of "T1/E1 Interface-Loss of Frame Sync" error messages accumulated at the CEC/IMC since the last **Clear Stats** command or the last TEC reset.

Frmr Alarm
This field indicates the number of Framing Errors accumulated at the CEC/IMC since the last **Clear Stats** command or the last TEC

reset. A Framing Error occurs on the T1/E1 Interface Card in response to several different types of data framing errors.

Rem Alarms
This field indicates the number of Remote Alarms accumulated at the CEC/IMC since the last **Clear Stats** command or the last TEC reset. A Remote Alarm is transmitted to the T1/E1 Interface Card by the equipment at the opposite end of the T1/E1 link to indicate an error condition such as Framing Errors, Loss of Signal, etc.

Par Errors
(E1 line type operating in CRC multi-frame mode only.)
Indicates the number of Parity Errors accumulated at the CEC/IMC since the last **Clear Stats** command.

CRC4 Alarm
(E1 line type operating in CRC multi-frame mode only.)
Indicates the number of CRC multi-frame synchronization errors accumulated at the CEC/IMC since the last **Clear Stats** command.

Cards Active
Indicates which card is the primary "PRI" and which cards are secondary "SEC." Also indicates which card positions are not occupied (non existent) "NE." In addition, at the T1/E1 Interface Card LED DS7 (labeled "SEC") will be illuminated for any cards indicated as secondary. **NOTE:** Redundancy is currently not supported.

Statistics Last Cleared
Displays the time and date of the last **Clear Stats** command.

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5. CHAPTER 5
OFF-LINE DIAGNOSTICS

5.1 OFF-LINE DIAGNOSTIC FUNCTIONS

The CEC/IMC Manager (MOM PC) has two off-line MS-DOS® utilities to extract data from the data log buffer stored on the hard disk.

CALLS.EXE	Used to extract all calls made within the CEC/IMC
GSCMON.EXE	Used to extract all messages from the log

NOTE

It is recommended that the data log files be backed up to a floppy disk weekly and removed from the hard disk. This eliminates the hard disk from filling up and disabling data logging.

Open an MS-DOS window. From the Windows Program Manager window double-click on the "Main" icon, then double-click on the "MS-DOS Command Prompt" icon.

At the DOS prompt type: **c:\winmom\calls.exe** to execute the CALL.EXE utility, or **c:\winmom\gscmon.exe** to execute the GSCMON.EXE utility. (If the CEC/IMC Manager is installed on a drive other than C drive, substitute that drive designation for "c" in the above commands.)

5.1.1 CALLS.EXE

The CALLS function is used to extract channel assignment/drop messages from the data log buffer. It can be a vital tool in tracing calls through the system.

The user may obtain help for the CALLS function by using the "**/h**" option on the command line. For example: **calls /h**

The following help message will be displayed:

Calls - extract channel assignment/drop data from data log buffer
Syntax: calls [<options>]

Options:

/bhh:mm:ss	start time of data extraction
/ehh:mm:ss	stop time of data extraction
/dmm-dd-yy	date of data log file
/s	soft copy output requested
/h	display help file then exit

The output from the CALLS function displays the time of the assignment/drop, accurate to 480 msec, the TDM bus and slot the call is/was on, the channel the host used to process the call, the host (site or console) the call was made to/from, the message group and sub group of the type of call, a call variant field for console originated CEC/IMC originated/radio originated, and the CALLEE and CALLER involved in the call.

Valid message groups and sub groups are:

CHN ASS	Channel Assignment
GCV	Clear Voice (CV) Group
EGCV	Emergency CV Group CALL
GVG	Voice Guard (VG) Group
EGVG	Emergency VG Group
ICV2	ICall II CV
IVG2	ICALL II VG
IDA	Data ICall
GDA	Data Group
SGCV	Special Call Group CV
SG I	Special Call Group Interconnect
SGVG	Special Call Group VG
SGVGI	Special Call Group VG Inter
SICV	Special Call Individual CV
SI I	Special Call Indiv Inter
SIVG	Special Call Indiv VG
SIVGI	Special Call Indiv VG Inter
ICV	ICall CV
IVG	ICall VG
ACVMT	System All Call CV, msg trunked
ACVTT	System All Call CV, Tx trunked
ACVMTU	System All Call CV Update, msg trunk
ACVTTU	System All Call CV Update, Tx trunked
AVGMT	System All Call VG, msg trunked

AVGTT	System All Call VG, Tx trunked
AVGMTU	System All Call VG Update, msg trunked
AVGTTU	System All Call VG Update, Tx trunked
CTI	Indiv Inter (CTIS)
CTIVG	Indiv Inter (CTIS) VG
CTG	Group Inter (CTIS)
CGGVG	Group Inter (CTIS) VG
ECTG	Emergency Group Inter (CTIS)
ECTGVG	Emergency Group Inter (CTIS) VG
SCTI	Special Inter (CTIS)
SCTIVG	Special Inter (CTIS) VG
EIDA	Emergency Data ICALL
EGDA	Emergency Data Group
GVC	Voice Guard Clear Voice (VGCV) Group
EGVC	Emergency VGCV Group
IVC2	ICall II VGCV
SGVCI	Special Call Group VGCV
SGVCI	Special Call Group VGCV Inter
SIVC	Special Call Indiv VGCV
SIVCI	Special Call Indiv VGCV Inter
IVC	ICall VGCV
AVCMT	System All Call VGCV, Msg trunked
AVCTT	System All Call VGCV, Tx trunked
AVCMTU	System All Call VGCV Update, Msg trunked
AVCTTU	System All Call VGCV Update, Tx trunked
CTIVC	Indiv Inter (CTIS) VGCV
CTGVC	Group Inter (CTIS) VGCV
ECTGVC	Emergency Group Inter (CTIS) VGCV
SCTIVC	Special Inter (CTIS) VGCV
SEC ACK	Secondary Acknowledgment – Used to indicate secondary sites involved
CHN UKY	Channel Unkey – No valid sub group
CHN DRP	Channel Drop
DROP	Channel Drop

A sample output of the **CALLS** function using the following command line will look like:

calls /d09-12-91 /b14:00:00 /e15:00:00 /s

TIME	BUS	SLOT	CHN	HOST	MSG GROUP	MSG SUB GROUP	CALL VAR	CALLEE	CALLER
14:12:01.44	0	3	1	1	CHN ASS	GCV	80	CNV 1	IND 45
14:12:01.44	0	3	1	1	CHN DRP	DROP	80	CNV 1	IND 45
14:12:01.44	0	3	1	1	CHN ASS	GCV	80	CNV 1	IND 45
14:12:01.44	0	3	1	1	CHN DRP	DROP	80	CNV 1	IND 45
14:20:17.76	3	1	4	10	CHN ASS	GCV	0	GRP 273	IND 1955
14:20:19.68	3	1	4	10	CHN DRP	DROP	0	GRP 273	IND 1955
14:20:20.16	0	1	1	10	CHN ASS	GCV	0	GRP 273	IND 1955
14:20:23.04	0	1	1	10	CHN DRP	DROP	0	GRP 273	IND 1955
14:20:23.04	2	1	3	10	CHN ASS	GCV	0	GRP 273	IND 1955
14:20:24.48	2	1	3	10	CHN DRP	DROP	0	GRP 273	IND 1955
14:20:24.48	3	1	4	10	CHN ASS	GCV	0	GRP 273	IND 1955
14:20:27.84	3	1	4	10	CHN DRP	DROP	0	GRP 273	IND 1955
14:20:28.32	0	1	1	10	CHN ASS	GCV	0	GRP 273	IND 1955
14:20:34.08	0	1	1	10	CHN DRP	DROP	0	GRP 273	IND 1955
14:20:34.56	2	1	3	10	CHN ASS	GCV	0	GRP 273	IND 1955
14:20:35.52	2	1	3	10	CHN DRP	DROP	0	GRP 273	IND 1955
14:36:48.48	1	8	3	1	CHN ASS	GCV	80	GRP 273	IND 45
14:36:48.48	1	8	3	1	CHN DRP	DROP	80	GRP 273	IND 45
14:36:48.96	1	8	4	1	CHN ASS	GCV	80	GRP 273	IND 45
14:36:48.96	1	8	4	1	CHN DRP	DROP	80	GRP 273	IND 45
14:36:48.96	1	8	1	1	CHN ASS	GCV	80	GRP 273	IND 45
14:36:48.96	1	8	1	1	CHN DRP	DROP	80	GRP 273	IND 45
14:36:48.96	1	8	3	1	CHN ASS	GCV	80	GRP 273	IND 45
14:36:49.44	1	8	3	1	CHN DRP	DROP	80	GRP 273	IND 45
14:36:49.44	1	8	4	1	CHN ASS	GCV	80	GRP 273	IND 45
14:36:49.44	1	8	4	1	CHN DRP	DROP	80	GRP 273	IND 45
14:36:55.68	1	8	1	1	CHN ASS	GCV	80	GRP 2047	IND 45
14:36:56.16	1	8	1	1	CHN DRP	DROP	80	GRP 2047	IND 45
14:36:56.16	1	8	3	1	CHN ASS	GCV	80	GRP 2047	IND 45
14:36:56.16	1	8	3	1	CHN DRP	DROP	80	GRP 2047	IND 45
14:36:56.16	1	8	4	1	CHN ASS	GCV	80	GRP 2047	IND 45
14:36:56.64	1	8	4	1	CHN DRP	DROP	80	GRP 2047	IND 45
14:36:56.64	1	8	1	1	CHN ASS	GCV	80	GRP 2047	IND 45
14:36:56.64	1	8	1	1	CHN DRP	DROP	80	GRP 2047	IND 45
14:37:02.40	2	1	3	10	CHN ASS	GCV	0	GRP 2047	IND 16383
14:37:02.40	2	1	3	10	CHN DRP	DROP	0	GRP 2047	IND 16383
14:38:08.64	3	1	4	10	CHN ASS	GCV	0	GRP 2047	IND 16383
14:38:08.64	3	1	4	10	CHN DRP	DROP	0	GRP 2047	IND 16383
14:41:49.92	1	8	1	1	CHN ASS	EGCV	82	GRP 273	IND 45
14:41:49.92	1	8	1	1	CHN UKY	-	80	GRP 273	IND 45

5.1.2 GSCMON.EXE

The GSCMON function is used to extract all messages from the data log buffer. It can be a vital tool in tracing calls through the system.

The user may obtain help for the GSCMON function by using the "**/h**" option on the command line. For example: **gscmon /h**

The following help message will be displayed:

GSC Monitor - extract all GSC activity
Syntax: gscmon [<options>]

Options:

/bhh:mm:ss	start time of data extraction
/ehh:mm:ss	stop time of data extraction

/dmm-dd-yy	date of data log file
/s	soft copy output requested
/n	suppress node active messages
/h	display help file then exit

The output from the GSCMON function displays the time of the message and the message contents. The interface module (node) ids seen at the hardware GSC monitor are not output. The expected input filename is mm_dd_yy.dlg. The output filename is mm_dd_yy.mon.

gscmon /d12-30-92 /b09:10:00 /e09:10:08

```
   TIME          DATA
09:10:00.00   82 2C 01 0E 00 00 40 09
09:10:00.00   82 12 01 07 00 00 40 09
09:10:00.00   82 1F 04 01 00 00 50 09
09:10:00.00   82 0B 01 06 00 00 60 09
09:10:00.00   82 14 01 0C 00 00 40 09
09:10:01.44   66 01 02 17 01 01 0E 31 03 02 00 3A 06 01 00
09:10:01.92   82 50 01 01 00 00 40 09
09:10:01.92   82 1F 04 01 00 00 50 09
09:10:01.92   82 47 05 02 00 00 69 09
09:10:01.92   82 6D 01 09 00 00 40 09
09:10:01.92   82 3B 00 01 00 00 49 09
09:10:01.92   82 57 01 0B 00 00 40 09
09:10:03.36   66 05 00 15 01 01 02 31 03 02 00 1E 06 01 00
09:10:03.84   82 1F 04 01 00 00 50 09
09:10:03.84   82 7D 01 02 00 00 40 09
09:10:03.84   82 7A 01 05 00 00 40 09
09:10:03.84   82 91 01 0D 00 00 40 09
09:10:03.84   82 89 01 08 00 00 40 09
09:10:03.84   82 A5 01 04 00 00 40 09
09:10:04.80   66 05 00 17 01 01 02 31 03 02 00 1E 06 01 00
09:10:05.76   82 DF 01 03 00 00 40 09
09:10:05.76   82 BB 01 0A 00 00 40 09
09:10:05.76   82 1F 04 01 00 00 50 09
09:10:07.20   10 02 FB 00 04 00 00 09
09:10:07.68   82 2C 01 0E 00 00 40 09
09:10:07.68   82 14 01 0C 00 00 40 09
09:10:07.68   82 1F 04 01 00 00 50 09
09:10:07.68   82 0B 01 06 00 00 60 09
09:10:07.68   82 12 01 07 00 00 40 09
```

gscmon /d12-30-92 /b09:10:00 /e09:11:00 /n

TIME	DATA
09:10:01.44	66 01 02 17 01 01 0E 31 03 02 00 3A 06 01 00
09:10:03.36	66 05 00 15 01 01 02 31 03 02 00 1E 06 01 00
09:10:04.80	66 05 00 17 01 01 02 31 03 02 00 1E 06 01 00
09:10:07.20	10 02 FB 00 04 00 00 09
09:10:08.64	66 06 00 15 01 01 03 31 03 02 00 1E 06 01 00
09:10:11.04	66 06 00 17 01 01 03 31 03 02 00 1E 06 01 00
09:10:11.04	66 07 00 15 01 01 04 31 03 02 00 3A 06 01 00
09:10:14.40	66 07 02 15 01 02 06 A4 07 02 00 06 00 03 00
09:10:15.36	66 07 02 17 01 02 06 A4 07 02 00 06 00 03 00
09:10:23.52	10 02 FB 00 04 00 00 09
09:10:32.16	66 07 00 17 01 01 04 31 03 02 00 3A 06 01 00
09:10:32.64	66 01 01 15 01 01 06 31 03 02 00 1E 06 01 00
09:10:35.04	66 01 01 17 01 01 06 31 03 02 00 1E 06 01 00
09:10:39.84	10 02 FB 00 04 00 00 09
09:10:53.76	66 01 03 15 01 02 08 08 00 03 00 08 00 03 00
09:10:55.20	66 07 02 15 01 02 06 A4 07 02 00 06 00 03 00
09:10:55.68	66 07 02 17 01 02 06 A4 07 02 00 06 00 03 00
09:10:55.68	66 07 02 15 01 02 06 A4 07 02 00 06 00 03 00
09:10:55.68	10 02 FB 00 04 00 00 09
09:10:56.16	66 01 03 17 01 02 08 08 00 03 00 08 00 03 00
09:10:56.64	66 07 02 17 01 02 06 A4 07 02 00 06 00 03 00
09:10:58.08	66 07 02 15 01 02 06 A4 07 02 00 06 00 03 00
09:10:58.56	66 05 01 15 01 01 0A 31 03 02 00 3A 06 01 00
09:10:59.04	66 07 02 17 01 02 06 A4 07 02 00 06 00 03 00

6. CHAPTER 6
NETCLOCK/2™ INTERFACE OPTION

6.1 OVERVIEW

A Coordinated Universal Time (UTC) standard option is available that allows the CEC/IMC to be synchronized to WWVB, operating on a frequency of 60 kHz, in Fort Collins, Colorado. This option uses Spectracom® Corporation's NETCLOCK/2™ WWVB receiver which interfaces to the CEC/IMC via an RS-232 serial port at the CEC/IMC Manager (usually COM2). With this option installed, the CIMs and consoles are synchronized to the UTC signals broadcast by WWVB.

NOTE

NETCLOCK/2 functions are now integrated into the Microsoft Windows NT operating system. Previously, NETCLOCK/2 functions were integrated into CEC/IMC Manager software program V4.0. The option was a Terminate Stay Resident (TSR) program in software versions prior to V3.0 (V2.12 and earlier).

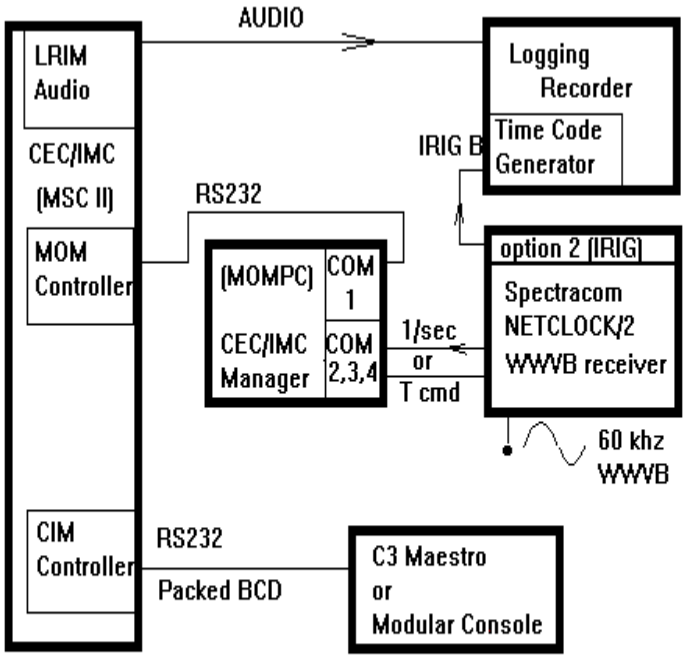


Figure 58 NETCLOCK/2 Configuration

Using the RS-232 serial connection, the CEC/IMC Manager reads the 26-character ASCII time/date data from the receiver and updates the MOM Controller Board. The MOM then provides synchronized time and date messages to the CIMs and consoles.

6.2 NETCLOCK INSTALLATION

The following procedures must be performed in order to implement the NETCLOCK/2 time synchronization option:

1. Verify a COM port on the CEC/IMC Manager is available (COM2, COM3 or COM4).
2. Configure Microsoft Timeserv.ini as described in Timeserv.wri for Spectracom NETCLOCK/2
3. Install and configure the NETCLOCK/2 in accordance with the manufacturer's instructions.

4. Connect the NETCLOCK/2 to an unused CEC/IMC Manager COM port. See the cable wiring diagrams that follow.

The NETCLOCK/2 has two RS-232 serial ports. One is an output that transmits the 26-character ASCII time/date data once each second in Format 0 or Format 1. This is called the 1/sec interface or the "REMOTE OUTPUT."

The other port responds to commands from the CEC/IMC Manager by transmitting a 26-character ASCII time/date data in Format 0, Format 1, or Format 2. This port transmits the data on the next even second after receiving an ASCII "T" from the CEC/IMC Manager. This is the T-CMD or "SERIAL COM" port. Refer to the section of the NETCLOCK/2 instruction manual concerning NETCLOCK/2 data formats for additional details.

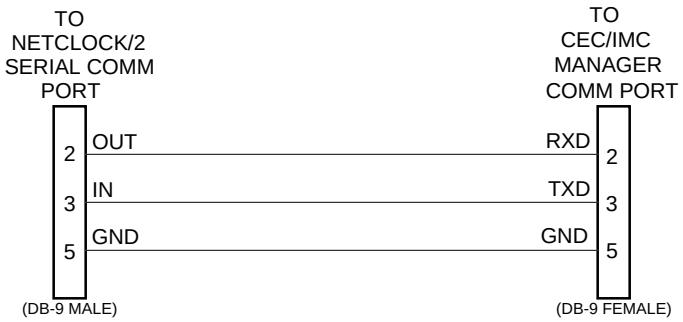
6.2.1 Hardware Installation Notes

TIME DATA FORMAT – Select the required data format:

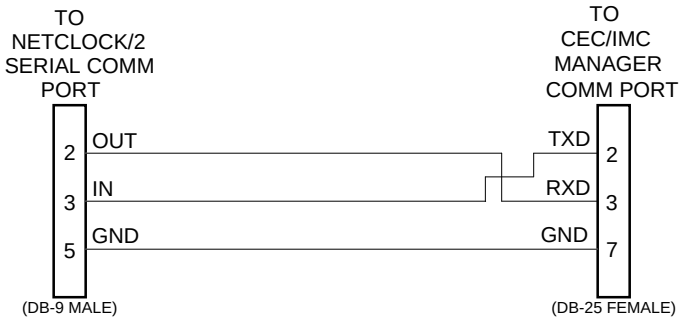
- FORMAT 0 – No date setting.
- FORMAT 1 – Date setting available.
- FORMAT 2 – Only available when using the T-CMD interface. Must use the Time Zone Correction setting at the CEC/IMC Manager. No date setting capability.

T-CMD Interconnections

The T-CMD interface (RS-232) requires a 9-pin male connector at the NETCLOCK/2. The CEC/IMC Manager end may be either 9-pin female or 25-pin female, depending on the specific configuration of the PC. (See Figure 59 below.)



9-Pin CEC/IMC Manager COM Port

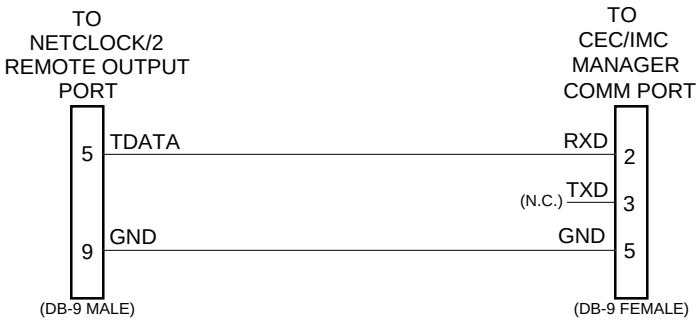


25-Pin CEC/IMC Manager COM Port

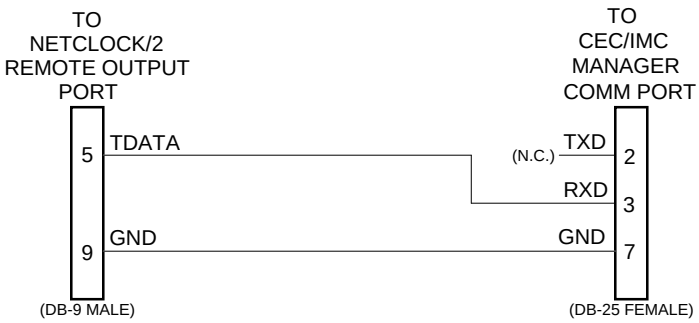
Figure 59 NETCLOCK/2 T-CMD Interconnections

1/sec (REMOTE OUTPUT) Interconnections

The 1/sec (REMOTE OUTPUT) requires a 9-pin male connector at the NETCLOCK/2. The CEC/IMC Manager end will be either 9-pin female or 25-pin female, depending on the specific configuration of the PC. (See Figure 60 below.)



9-Pin CEC/IMC Manager COM Port



25-Pin CEC/IMC Manager COM Port

Figure 60 NETCLOCK/2 Remote Output Connections

6.2.2 Software Installation Notes

The NETCLOCK/2 interface is integrated into the Microsoft Windows NT operating system. The Timeserv.exe must be configured by editing the Timeserv.ini as discussed in Timeserve.wri.

6.2.3 Additional Considerations

The following topics in the NETCLOCK/2 Instruction Manual are very important and should be reviewed closely prior to connecting the NETCLOCK/2 to the CEC/IMC Manager.

- Time Data Format
- Propagation Path Delay
- Path Delay Switches

- Time Zone Switches
- Baud Rate Switches
- Antenna Installation

6.3 INSTALLATION VERIFICATION

Before connecting the NETCLOCK/2 to the CEC/IMC Manager, the operator should verify the status of the three LED indicators on the front panel. All three should be illuminated green. A red "ANTENNA" LED indicates there has been a loss of antenna continuity. A red "SIGNAL" LED means the received signal is weak and carrier lock has been lost. This LED can be expected to flash red occasionally; this is only a problem if it stays red more than 7 hours. When time synchronization is lost the "TIME SYNC" LED will be red. Valid time messages will not be sent to the CEC/IMC Manager if the "TIME SYNC" LED is lit. During this condition, the CEC/IMC Manager will ignore the invalid data.

7. APPENDIXES

7.1 APPENDIX A - LOGGED ERROR DEFINITIONS

LOGGED ERROR MESSAGE	LOGGED ERROR DATA	CAUSE/ CORRECTIVE ACTION
E00-xxx: UNKNOWN ERROR		An error has been generated within the CEC/IMC, but the CEC/IMC Manager cannot determine what it is. This is usually a result of a Controller Board residing in the system with firmware prior to version 2.00 or with a firmware version more recent than the CEC/IMC Manager software version. **Corrective Action:** Ensure all Controller Boards in system are equipped with firmware version 2.00 or greater and the CEC/IMC Manager contains a software version greater than or equal to the most recent Controller Board firmware being used.
E01-019: HW FAIL - AUDIO BOARD	Data field is the Board affected.	Audio board type does not match configuration data, i.e. analog board, but configured for digital.

LOGGED ERROR MESSAGE	LOGGED ERROR DATA	CAUSE/ CORRECTIVE ACTION
E01-020: HW FAIL - CLOCK BANK	Lower byte is the clock which failed: 00h = A clock, 01h = B clock.	An Audio Board has detected a failed clock circuit. If three (3) of these errors are generated by three (3) different GSC nodes, a global system Clock Board failure will be issued. **Corrective Action:** If less than three (3) GSC nodes declare this error, the problem is with one or more of the Audio Boards at the interface module declaring the error. Observe the clock LEDs on the Audio Boards at the interface module generating the error. If they are all lit, the problem is likely in the clock failure detection circuit. If any of the LEDs are not lit, the problem is with the corresponding clock circuit on the Audio Board.
E01-037: HW FAIL - CLOCK BOARD	Lower byte is the clock which failed: 00h = A clock. 01h = B clock. Upper byte is reserved.	The redundant clock feature is enabled, and at least three (3) interface modules have declared a clock bank failure. **Corrective Action:** Provided the redundant clock is working, the CEC/IMC will switch to the redundant clock and the error will be cleared. The failed clock circuit should be repaired.

LOGGED ERROR MESSAGE	LOGGED ERROR DATA	CAUSE/ CORRECTIVE ACTION
E02-022: BUS FAIL - GSC BUS	Lower byte contains the bus number that failed, either 0 or 1 (in hex). The upper byte of the data word is reserved.	No poll response is being received, via the GSC bus, from a Controller Board set up to be an end node. Both the MOM and one other Controller Board must be set, by the DIP switches, to be end nodes in the system. This other Controller Board should be placed at the opposite end of the GSC bus relative to the MOM, preferably in the slot nearest to the Terminator Board. No other Controller Boards should have the end node dip switch bit set. When this error occurs, all devices in the CEC/IMC are commanded to switch to the alternate GSC bus. If an end node responds on the new GSC bus, the error will be cleared. If not, a switch is made back to the previous GSC bus. No further switching will occur until communications can be established with an end node. **Corrective Action:** Ensure the Controller Board furthest from the MOM Controller Board on the primary backplane structure has the end node DIP switch bit set. If the error remains, the probable cause is a physical break in the GSC bus.
E03-017: LINK FAIL - MULTINODE		Control data link failure between two interconnected NIMs.
E03-023: LINK FAIL - CEC/IMC MANAGER		Control data link failure between MOM Controller Board and CEC/IMC Manager (MOM PC).
E03-027: LINK FAIL - SITE		Control data link failure between MIM and Site Controller.

LOGGED ERROR MESSAGE	LOGGED ERROR DATA	CAUSE/ CORRECTIVE ACTION
E03-028: LINK FAIL - CONSOLE	0000h = CIM control data link failure. 0001h = Attached console is "Logged Out" or "Disabled." For a C3 Desktop/ Modular console, 0001h indicates the Translator-to-console control data link has failed.	Control data link failure between CIM and console.
E03-029: LINK FAIL - RECORDER (Reserved for future use.)		Control data link failure between LRIM and logging recorder.
E03-030: LINK FAIL - RSM MONITOR		Control data link failure between RIM and RSM equipment.
E03-031: LINK FAIL - CTIS		Control data link failure between PIM/CTIM and Jessica/CTIS equipment.
E03-035: LINK FAIL - HDLC CHANNEL A	No information is contained in the data word.	The idle flag sequence cannot be detected on HDLC channel A. **Corrective Action:** To clear the error, proper connection to HDLC channel A, via the backplane connector, must be made to a remote station that continuously transmits idle flag sequences at the correct bit rate.
E03-036: LINK FAIL - HDLC CHANNEL B	Lower byte of the data word contains 01h, indicating channel B. The upper byte of the data word contains the number of the Audio Board that stopped responding.	An Audio Board at a secondary address on HDLC channel B that was previously responding to polls has stopped responding. **Corrective Action:** To clear the error, an Audio Board set to the same number that caused the error must be placed in the system, or the Controller Board that originated the error must be reset.

LOGGED ERROR MESSAGE	LOGGED ERROR DATA	CAUSE/ CORRECTIVE ACTION
E05-021: INCOMPATIBLE - AUDIO BUS		
E05-023: INCOMPATIBLE - CEC/IMC MANAGER		
E06-116: INVALID VALUE - ASSIGNMENT	No information contained in the data word.	A Controller Board was installed that conflicted with an existing Controller Board. For example a MIM 6 and a VMIM 6, or two CIM 1s. **Corrective Action:** Both interface modules that are conflicting will have this error active. Change the device type/assignment setting of the board in error. All boards that conflicted must be reset to clear the error.
E07-119: INVALID REDUNDANCY - MULTIPLE END NODES	Lower byte of the data word contains the node ID of the existing end node. Upper byte of the data word is reserved.	This Controller Board is set up to be an end node, but an end node already exists in the system. This message replaces warning W06-119 beginning with MOM Controller Board firmware version 3.00. **Corrective Action:** To clear the error, only one (1) Controller Board should have its end node DIP switch set to the ON position.

LOGGED ERROR MESSAGE	LOGGED ERROR DATA	CAUSE/ CORRECTIVE ACTION
E08-18: DEVICE CONFLICT - CONTROL BOARD	No information in the data word.	A Controller Board device type/assignment setting is conflicting with another board's setting. For example a VMIM 5 and a MIM 5 will conflict with each other. The main information is the device type/assignment in the error heading. With the correct hardware revision, the ID LED will also be flashing on the offending board. Also, sometimes this error only applies to one board. (Example CCI, or second MOM mistakenly installed in main CEC/IMC rack). **Corrective Action:** The offending board must be removed and its type/assignment setting must be changed to not conflict with another device. The other device should also be displaying this error and it should also be reset.
E09-139: T1/E1 INTERFACE - LOSS OF SIGNAL	Data field is the T1/E1 Interface Card affected (1-8).	The T1/E1 Interface Card has lost its T1/E1 signal.
E09-140: T1/E1 INTERFACE - LOSS OF FRAME SYNC	Data field is the T1/E1 Interface Card affected (1-8).	A valid T1/E1 receive framing sequence no longer exists at the T1/E1 Interface Card. Two possible causes would be that the frame format changed at one end of the T1/E1 link or loss of the T1/E1 signal.
E09-141: T1/E1 INTERFACE - EXCESSIVE FRAME SLIPS	Data field is the T1/E1 Interface Card affected (1-8).	A Frame Slip occurs when a clocking frequency mismatch (at the card level) causes received frames to be repeated or discarded. Excessive frame slips indicate a clock failure on the T1/E1 Interface Card.

LOGGED ERROR MESSAGE	LOGGED ERROR DATA	CAUSE/ CORRECTIVE ACTION
E11-143: ENCRYPTION FAIL - LICENSE DATA BAD	None	This invalid feature data system error is issued if no license data is available. Starting with Group 12, CEC/IMC Software will require licenses to specify the operational features and maximum capacities for a CEC/IMC Node. The licenses must be installed at the CEC/IMC Manager PC for the desired feature/capacity to take effect and cannot be changed by the end user. If this error occurs all licenses should be checked using the license administration tool - see *EDACS Product Licenses for Windows NT Administration Guide* (AE/LZT 123 1906 R1A).

LOGGED ERROR MESSAGE	LOGGED ERROR DATA	CAUSE/ CORRECTIVE ACTION
E11-146: ENCRYPTION FAIL - LICENSE EXPIRED	Abbreviated name of license that has expired: "FS Patch" - Failsoft Patch "LL Data" - Landline Data (EDG) "LL Digi" - Landline Digital "MSC Type" - CEC/IMC switch type "Sites" - Max Number of Sites "Consoles" - Max Number of Consoles "Net I/F" - Max Number of NIMS "Rem CEC" - Minimum Number of Remote CEC NIMS "Causeway" - Max number of Causeway Patch/Simulselects "SiteChan" - Max number of site channels "NetChan" - Max number of Network (NIM) channels Normal data field contains no data (always 0).	The feature license has expired. The licensed feature will not actually be disabled until the CEC/IMC Manager for Windows NT is restarted. This is to allow the customer time to obtain any required licenses before a used feature is disabled. If this error occurs all licenses should be checked using the license administration tool - see *EDACS Product Licenses for Windows NT Administration Guide* (AE/LZT 123 1906 R1A).

7.2 APPENDIX B - LOGGED WARNING DEFINITIONS

LOGGED WARNING MESSAGE	LOGGED WARNING DATA	CAUSE/ CORRECTIVE ACTION
W00-xxx: UNKNOWN WARNING	(none)	A warning has been generated within the CEC/IMC, but the CEC/IMC Manager cannot determine what it is. This is usually a result of a Controller Board residing in the system with firmware prior to version 2.00 or with a firmware version more recent than the CEC/IMC Manager's software version. **Corrective Action:** Ensure all Controller Boards in system are equipped with firmware version 2.00 or greater and the CEC/IMC Manager contains a software version greater than or equal to the most recent Controller Board firmware being used.
W01-048: UNDEFINED - CALLEE TYPE	The callee type value that generated the warning.	Unknown callee type was found.
W01-049: UNDEFINED - CALLER TYPE	The caller type value that generated the warning.	Unknown caller type was found.
W02-028: OUT OF RANGE - CONSOLE NUMBER	Console number that generated the warning.	Console number found that was not in the allowed range of 1 – 32.
W02-032: OUT OF RANGE - BUS_SLOT	Low byte contains bus number. High byte contains slot number.	Bus or slot number found that was greater than the maximum number allowed.
W02-033: OUT OF RANGE - AUDIO CHANNEL	Audio channel number that generated the warning.	Audio channel number found that was not in the allowed range.

LOGGED WARNING MESSAGE	LOGGED WARNING DATA	CAUSE/ CORRECTIVE ACTION
W02-050: OUT OF RANGE - AUDIO SUM COUNT	Value of sum count when the attempt was made to add another channel.	Current summed audio list has the maximum number of channels allowed and an attempt was made to add an additional channel.
W02-051: OUT OF RANGE - CONSOLE LOG COUNT	Value of console log count that generated the warning.	Current number of console originated calls greater than maximum number of consoles allowed.
W02-052: OUT OF RANGE - MODULE COUNT	Value of console module count when the attempt was made to add another module.	Console module count currently at maximum and an attempt was made to add another module.
W02-115: OUT OF RANGE - PATCH/SIMUL	Value of entry count when the attempt was made to add another entry.	An attempt was made to add another entry (create a patch/simulselect), but the MOM Controller Board patch/simulselect table already contains the maximum number of entries.
W02-121: OUT OF RANGE - UNIT ID	Unit ID that generated the warning.	Unit ID found that was greater than maximum allowed.
W02-122: OUT OF RANGE - GROUP ID	Group ID that generated the warning.	Group ID found that was greater than maximum allowed.
W02-131 & W02-132: OUT OF RANGE - DEVICE TYPE/ ASSIGNMENT	Bad device or assignment (usually FFh).	A Controller Board has an invalid device type or assignment DIP switch setting. **Corrective action:** Check the board's DIP switches.
W03-064: UNSUPPORTED ID - CONSOLE ICOM REQ	Message ID value that generated the warning.	Unsupported message ID from a CIM.
W03-065: UNSUPPORTED ID - MODULE PROGRAM REQUEST	Message ID value that generated the warning.	Unsupported message ID from a CIM or LRIM.

LOGGED WARNING MESSAGE	LOGGED WARNING DATA	CAUSE/ CORRECTIVE ACTION
W03-066: UNSUPPORTED ID - PATCH/ SIMULSELECT	Message ID value that generated the warning.	Unsupported message ID from a CIM, MIM, NIM, LRIM or MOM.
W03-067: UNSUPPORTED ID - SYSTEM MANAGER REC	Message ID value that generated the warning.	During a System Manager database upload, an unsupported CIM or MIM message ID will cause this warning to be logged.
W04-080: UNSUPPORTED GRP - CALL STATUS	Message group value that generated the warning.	Unsupported message group from CIM or NIM.
W04-081: UNSUPPORTED GRP - CHAN PRIM	Message group value that generated the warning.	Unsupported message group from a site-type interface module (MIM, NIM, VMIM, CTIM, PIM, etc.).
W04-082: UNSUPPORTED GRP - CONSOLE TRANSMIT REQUEST	Message group value that generated the warning.	Unsupported message group from a CIM or site-type interface module (MIM, NIM, VMIM, CTIM, PIM, etc.).
W04-083: UNSUPPORTED GRP - SLOT ASSGN	Message group value that generated the warning.	Unsupported message group from a CIM or site-type interface module (MIM, NIM, VMIM, CTIM, PIM, etc.).
W04-084: UNSUPPORTED GRP - INTER CONSOLE	Message group value that generated the warning.	Unsupported message group from a CIM.
W05-096: UNSUPPORTED SUB GRP - AUDIO CHAN CONFIG	Message subgroup value that generated the warning.	Unsupported message sub group from a CIM.
W05-097: UNSUPPORTED SUB GRP - CHAN ASSGN	Message subgroup value that generated the warning.	Unsupported message group from a site-type interface module (MIM, NIM, VMIM, CTIM, PIM, etc.).
W05-098: UNSUPPORTED SUB GRP - STATUS	Message subgroup value that generated the warning.	Unsupported message group from a site-type interface module (MIM, NIM, VMIM, CTIM, PIM, etc.).

LOGGED WARNING MESSAGE	LOGGED WARNING DATA	CAUSE/ CORRECTIVE ACTION
W06-033: MISMATCH - AUDIO CHANNEL	Logical ID (LID) of the unit that experienced the missed channel drop.	The CEC/IMC has received a channel assignment for a unit that is marked active on another channel. This is a missed channel drop condition – the CEC/IMC will drop the existing channel before routing the new channel assignment.
W06-116: MISMATCH - ASSIGNMENT	Site number reported in the Site ID record from the site.	The MIM assignment from the DIP switches does not match the site number reported from the site. This warning will only be issued once by the MIM when detected.
W06-119: MISMATCH - MULTIPLE END NODES	(none)	A second Controller Board has responded that is set up to be an end node. This message is not generated by MOM Controller Board firmware version 3.00 (or later); it is replaced by error message E07-119.
WO6-134: MISMATCH - BACKUP ID	New backup node ID	MOM has received a new backup node ID for a redundant MIM pair and has overwritten the old backup ID. This warning may occur when changing/resetting the primary/ secondary MIMs, and is not a problem in this case. However, if this warning occurs at any other time it indicates the MOM may be confused about the primary/backup IDs; backup operation should be verified (reset primary/secondary nodes). This situation is most likely to occur if a third MIM with the same assignment is mistakenly installed in the CEC/IMC.
W07-115: OVERFLOW - PATCH/ SIMULSELECT	The maximum number of simultaneous patches and simulselects allowed on this switch.	An attempt was made to create a patch/simulselect, but the MOM Controller Board patch/simulselect table already contains the maximum number of entries.

LOGGED WARNING MESSAGE	LOGGED WARNING DATA	CAUSE/ CORRECTIVE ACTION
W07-120: OVERFLOW - MOM ERROR ARRAY	(none)	A new error message has been received, but the MOM error status array is full. The status of the new error will not be stored.
W08-084: CALL BLOCK - INTERCONSOLE	Message group value that generated the warning.	Unsupported message group between consoles.
W08-112: CALL BLOCK - NO CIRCUIT	DVIM device/assignment	The DVIM did not have digital decryption channel available for a radio-originated encrypted call. Wide area (multisite) radio-to-radio calls are routed.
W09-113: CALL ROUTING - CONTENTION	The message group, subgroup, caller and callee of the call that was routed only to dispatch consoles due to contention with an already active call.	Multiple units attempted to transmit to the same callee at the same time. The CEC/IMC will only allow one active transmitter on a talk group. The "rejected" call will be routed to all dispatch consoles but will not be routed to other sites. This leaves the sites all hearing the same (original) transmitter, but the consoles hearing all transmissions.
W09-125: CALL ROUTING - CONFIRM FAIL	(see below)	Confirmed Call related warnings. This warning is generated from multiple causes:
	The caller and callee of the failed confirmed call. The failure reason, as well as a bit mask of all required sites that did not successfully respond is also included. Each bit corresponds to a site number (1-32): 00000001H = Site 1, 80000000H = Site 32	Radio PTT causes: A confirmed group call did not receive working channel assignments from all required sites for the confirmed group. The call will time out and transmit in any event after 6-10 seconds.
	"Time Out"	No response received from expected site(s).

LOGGED WARNING MESSAGE	LOGGED WARNING DATA	CAUSE/ CORRECTIVE ACTION
	"Queued"	Call was queued at secondary site(s).
	"Sys Busy"	Call received System Busy at secondary site.
	"Denied"	Call was denied at secondary site.
	"Inv Chan"	Call received an invalid channel assignment.
	"FS2"	Expected site was in FAILSOFT 2.
	"No MIM"	Expected site MIM was not active in system.
	"Rcv Call"	Call lost contention to call from other site.
		Encrypted Jessica / CTIS causes
	"DVIM Decrypt" and caller and callee of the failed confirmed call.	The DVIM did not decrypt the radio-to-landline call.
	"CTIM Sec Ack" warning and the caller and callee of the failed confirmed call.	A secondary acknowledgment was not received from the PIM/CTIM for the radio originated encrypted Jessica/ CTIS call.
	"DVIM Sys Busy" warning and the caller and callee of the failed confirmed call.	There are no DVIU resources available to perform the encryption/decryption of the encrypted Jessica/CTIS call.
	"CIC Queued" warning and the caller and callee of the failed confirmed call.	The encrypted Jessica/CTIS call was queued at the landline interface.
	"CIC Sys Busy" warning and the caller and callee of the failed confirmed call.	The encrypted Jessica/CTIS call received a "system busy" at the landline interface.

LOGGED WARNING MESSAGE	LOGGED WARNING DATA	CAUSE/ CORRECTIVE ACTION
	"CIC Denied" warning and the caller and callee of the failed confirmed call.	The encrypted Jessica/CTIS call was denied at the landline interface.
	"CTIM Duplex" warning and the caller and callee of the failed confirmed call.	A "call back" was not received from the landline interface for the encrypted Jessica/CTIS call. This "call back" is required for the full duplex operation as well as ringing tone connections.
	"DVIM Encrypt" warning and the caller and callee of the failed confirmed call.	The DVIM did not encrypt the landline-to-radio call.
	"MIM Sec Ack" warning and the caller and callee of the failed confirmed call.	A Secondary Acknowledgment was not received from the MIM for the landline originated encrypted Jessica/CTIS call.
	"Site Queued" warning and the caller and callee of the failed confirmed call.	The landline originated encrypted Jessica/CTIS call was queued at the site.
	"Site Sys Busy" warning and the caller and callee of the failed confirmed call.	The landline originated encrypted Jessica/CTIS call received a "System Busy" from the site.
	"Site Denied" warning and the caller and callee of the failed confirmed call.	The landline originated encrypted Jessica/CTIS call was denied at the site.
W10-018: TIMEOUT - CONTROLLER BOARD	No data, the Node ID device assignment and device type fields of the warning identify the board.	A Controller Board in the CEC/IMC did not respond to a poll from the MOM Controller Board. The board will be marked as inactive at the CEC/IMC Manager. This warning will occur when a Controller Board is removed from the CEC/IMC. Other times indicate a problem with the reported Controller Board.

LOGGED WARNING MESSAGE	LOGGED WARNING DATA	CAUSE/ CORRECTIVE ACTION
W10-114: TIMEOUT - SAFETY TIMER	Channel number that was cleared.	The NIM (StarGate systems) has received no activity on an active channel for approximately ten (10) minutes. The NIM will clear the channel at this point and issue this warning.
W11-118: REDUNDANT - PRIMARY/ SECONDARY SWITCH	The GSC address of the secondary node that switched.	Secondary MIM Controller Board has switched to become a primary MIM Controller Board.
W12-036: LINK FAIL - HDLC CHANNEL B	The Audio Board number that failed to respond.	An Audio Board with slots allocated to it has failed to respond to S-Frame polls from the Controller Board. This warning could indicate the high speed serial link (HDLC Protocol) between the Controller Board and one of its Audio Boards is not functioning. This warning will also be generated if slots are allocated but the board is not installed in the switch.
W13-099: CALLEE NOT FOUND - CIM MODULE TABLE	Callee ID that could not be found.	The given callee ID could not be found in the CIM Module Table.
W13-100: CALLEE NOT FOUND - CIM CHANNEL DATABASE	Callee ID that could not be found.	The given callee ID could not be found in the CIM Channel Database.
W14-101: NDC DATA - SUM DATA	Channel number.	An attempt was made to sum data on the same audio channel.
W15-129: UNAVAILABLE - SAID VALUE	Number of SAIDs allocated to this switch.	All SAIDs (System Assigned Group IDs) allocated to this switch are currently in use by other patches/simulselects.

LOGGED WARNING MESSAGE	LOGGED WARNING DATA	CAUSE/ CORRECTIVE ACTION
W15-144: UNAVAILABLE - FAILSOFT PATCH	Data field contains Logical ID (in hex) of the console that attempted to perform a patch.	The attempted action was denied because the system was in Failsoft operation and the Failsoft Patch feature was not enabled. The system must be returned to trunked operation or the Failsoft Patch feature license must be installed for the patch to succeed.
W16-017: VALUE IN USE - MULTINODE	Switch ID that is duplicated.	A NIM received a call from another CEC/IMC with the same switch ID as this CEC/IMC. (Set by the MOM Controller Board assignment DIP switch). For proper call arbitration on a StarGate network, each CEC/IMC must have a unique switch ID.
W16-129: VALUE IN USE - SAID VALUE	The SAID value.	An attempt was made to create a patch/simulselect with a SAID (System Assigned Group ID) that was already being used by another patch/simulselect.
W17-120: AUXILIARY I/O - MOM ERROR ARRAY	(none)	The MOM auxiliary I/O error/warning alarm list is full. This should not normally occur. The list has an entry for each possible event. **Corrective Action:** Reset the MOM and resend the auxiliary I/O definitions from the CEC/IMC Manager.
W17-130: AUXILIARY I/O- STATE CHANGE	This warning uses specially formatted data to identify the event and the current state.	A defined auxiliary I/O event has changed states – active to inactive or inactive to active. This warning provides a record of Aux. I/O activity and, at the CEC/IMC Manager, it may be suppressed for any Aux. I/O event.

LOGGED WARNING MESSAGE	LOGGED WARNING DATA	CAUSE/ CORRECTIVE ACTION
Notes for W18-xxx warnings: Controller Boards with firmware versions prior to 2.12 do not log these warnings. For Controller Boards with firmware versions 2.12 or greater but less than 3.00, W18-132 will be logged for changes in device type, version number, and date/time stamp. For these versions also note the following: 1) the node ID of the source node will always be FFh, 2) the upper byte of the data word will contain the new device type value and the lower byte will be either the previous device type value, if the device type has changed, or the value FFh. For CCI Controller Board version 2.12 and greater, the source node ID will always be FFh.		
W18-131: NOVRAM CLEAR - NEW DEVICE ASSIGNMENT	Previous assignment value in upper byte, current assignment value in lower byte.	Non-volatile RAM (NOVRAM) cleared on Controller Board due to a change in device assignment DIP switches. This only occurs on certain device personalities.
W18-132: NOVRAM CLEAR - NEW DEVICE TYPE	Previous type value in upper byte, current type value in lower byte.	Non-volatile RAM (NOVRAM) cleared on Controller Board due to a change in device type DIP switches.
W18-133: NOVRAM CLEAR - INVALID CHECKSUM	Either the computed checksum, or the value 0055h	Non-volatile RAM (NOVRAM) cleared on Controller Board due to one of the following: 1) computed checksum did not match the stored checksum, 2) a key value stored in NOVRAM did not match the value in the 80C186 ROMs (e.g. version number, date/time stamp, etc.).
W19-115: DENIED - PATCH/ SIMULSELECT	The SAID value assigned to the patch/simulselect.	A site has denied the activation of a patch or simulselect. If multiple sites deny it, only the first denial received is logged.
Note for W20-xxx warnings: These warnings are applicable only for StarGate systems that have conventional channels installed on more than one CEC/IMC in the StarGate network.		

LOGGED WARNING MESSAGE	LOGGED WARNING DATA	CAUSE/ CORRECTIVE ACTION
W20-136: CONV CHAN - CONFLICT	Channel number in conflict.	A conventional channel definition has been received from a remote CEC/IMC that falls within the local CEC/IMC conventional channel range. Each CEC/IMC has a unique conventional channel range assignment of sixty-four (64) channels or less. **Corrective Action:** Verify each CEC/IMC has a unique switch assignment number (node ID) assigned via the MOM Controller Board DIP switches. StarGate conventional operation will not function correctly unless each CEC/IMC switch assignment number is unique.
W20-137: CONV CHAN - DEFINED	Channel that has been defined in lower byte. Source CEC/IMC switch assignment number in upper byte.	A conventional channel has been defined on a remote CEC/IMC Manager, and the definition has been received by this CEC/IMC Manager. This warning is for information purposes only. It is generated as part of normal operation to provide a record of remote conventional channel configuration changes on this CEC/IMC.
W20-138: CONV CHAN - DELETED	Channel that has been deleted in lower byte. Source CEC/IMC node ID in upper byte.	A remotely defined conventional channel has been deleted at the remote CEC/IMC Manager. This warning is for informational purposes only and is a result of normal operation.
W21-142: T1/E1 INTERFACE - CONNECTION MEMORY RESET	Data field is the T1/E1 Interface Card affected (1-8).	A Connection Memory Reset has occurred at the CEC/IMC. The Connection Memory stores input-to-output routing maps and thus controls the flow of audio and/or data signals on the T1/E1 Interface Card. A Connection Memory Reset will cause the TEC to issue a clock failure and be re-initialized by the Controller Board.

LOGGED WARNING MESSAGE	LOGGED WARNING DATA	CAUSE/ CORRECTIVE ACTION
W24-147: LICENSED FEATURE - EXPIRES	Abbreviated name of license that has expired: "FS Patch" - Failsoft Patch "LL Data" - Landline Data (EDG) "LL Dig" - Landline Digital "MSC Type" - CEC/IMC switch type "Sites" - MAX Number of Sites "Consoles" - MAX Number of Consoles "Net I/F" - MAX Number of NIMs "Em CEC" - Minimum Number of Remote CEC NIMS "Causeway" - Max number of Causeway Patch/Simulselects "SiteChan" - Max number of site channels "NetChan" - Max number of Network (NIM) channels Data field contains the number of days until expiration.	Pending License expiration warnings are issued for any license that will expire within 30 days. The licensed feature will not actually be disabled until the CEC/IMC Manager for Windows NT is restarted. This is to allow the customer time to obtain any required licenses before a used feature is disabled.

7.3 APPENDIX C - SNMP AGENT and PROXY for CEC/IMC (Optional)

The CEC/IMC Manager SNMP AGENT is a DLL (Dynamic Link Library) that is installed as an extension to the Microsoft SNMP Extendible Agent. The DLL must be installed through REGEDT into the registration database as an extension to the Extendible Agent. The DLL provides three routines (Snmp Extension Init, Snmp Extension Trap, Snmp Extension Query) used to interface to the Extendible Agent.

Extension Agent Installation

The following steps must be followed to manually modify the Registration Database so that the extension agent (w_imcagt.dll) can be used by the Microsoft Extendible Agent. Normally the agent is **not** installed as part of the CEC/IMC Manager for Windows NT V5.0 setup, but as a separate installation diskette.

- Open an MS-DOS window. From the Windows Program Manager window double click on "Main" icon, then double click on "MS-DOS Command Prompt" icon.
- At the DOS prompt type: **regedt32**, and press **Enter** key to invoke the registration database editor.
- Select the HKEY_LOCAL_MACHINE window, and move down the directory tree to the entry:

  SYSTEM\CurrentControlSet\Services\SNMP\Parameters\ ExtensionAgents

- Select Edit from the menu bar and Add Value from the drop-down menu. In the Add Value dialog box enter **3** (or the next highest available number) for the Value Name. The data type should already be set to REG_SZ. Choose **OK** to add this value. The program will then ask for a string in the text box provided, enter EXACTLY:

  SOFTWARE\Ericsson\EDACS\CurrentVersion

  Choose **OK**. The resulting string in the right-hand side of the screen should like:

  3:REG_SZ:SOFTWARE\Ericsson\EDACS\Current Version

- Move down the directory tree (left-hand side of the screen) to the SOFTWARE entry. Click on the SOFTWARE entry so that it is highlighted. Select Edit from the menu bar and Add Key from the drop-down menu. For Key Name enter **Ericsson**, and leave the Class field blank. Choose **OK**.
- Click on the Ericsson entry so that it is highlighted. Select Edit from the menu bar and Add Key from the drop-down menu. For Key Name enter **EDACS**, and leave the Class field blank. Choose **OK**.
- Click on the EDACS entry so that it is highlighted. Select Edit from the menu bar and Add Key from the drop-down menu. For Key Name enter **CurrentVersion**, and leave the Class field blank. Choose **OK**.
- Click on the CurrentVersion entry so that it is highlighted. Select Edit from the menu bar and Add Value from the drop-down menu. For Key Value enter **Pathname**. The Data Type should be set to REG_SZ. Choose **OK**. The program will then ask for a string in the space provided, enter EXACTLY:

  C:\WINMOM\W_IMCAGT.DLL

  Choose **OK**. The resulting string in the right-hand side of the screen should look like:

  Pathname:REG_SZ:C:\WINMOM\W_IMCAGT.DLL

- Exit the MS-DOS window and return to the Windows Program Manager.

7.4 APPENDIX D - FONT SELECTABLE DIALOG BOXES

Console Channel Configuration dialog box
- Text in scroll boxes

DVIM Channel Configuration dialog box
- Text in scroll boxes

C3 Modular/Desktop Console Configuration dialog box
- Text in scroll boxes

Site Channel Configuration List dialog box
- Text in scroll boxes

Site Channel Configuration dialog box
- Text in scroll boxes

Console Privilege List dialog box
- Text in scroll boxes

Diagnostics dialog box
- Text in scroll boxes

Unit/Group Location and Unit Logout dialog box
- Text in scroll boxes and column headers

Patch and Simulselect View dialog box
- Text in scroll boxes and column headers

CEC/IMC Diagnostics dialog box
- All text

Logging Recorder Configuration dialog box
- Text in scroll boxes

DC Controlled Station State Table Mapping dialog box
- Text in scroll boxes

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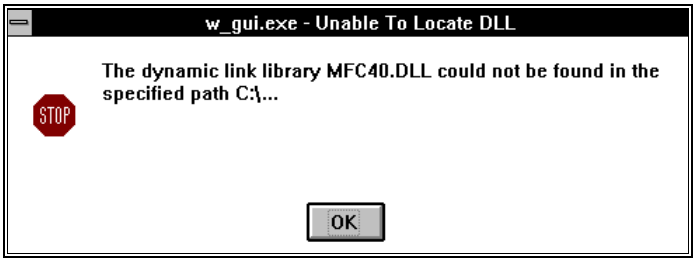
7.5 APPENDIX E - POPUP MESSAGE BOX DEFINITIONS

The CEC/IMC Manager server (GUI_SERVER.exe) is not available. This may be only a momentary condition and choosing Retry may begin the client program (W_GUI.exe). The name "mom_lab1" is a fictitious name, the name displayed will be the actual name of the machine (computer) running the CEC/IMC Manager server or a TCP/IP address of the form XXX.XXX.XXX.XXX.

The CEC/IMC Manager server (GUI_SERVER.exe) is not available and has caused the client program (W_GUI.exe) to shut down. The client program will have to be restarted from the WINMOM program group in the Windows NT Program Manager. The name "mom_lab1" is a fictitious name, the name displayed will be the actual name of the machine (computer) running the CEC/IMC Manager server.

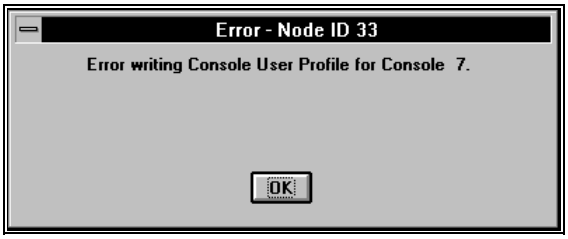


One or more required files could not be located when attempting to execute the client program. In the example shown above the DLL file "MFC40.DLL" could not be found in the specified path C:\…, where "C" is the drive where the client program is installed and "…" would be replaced by the remaining path name for the client program. Both of these are customer installation specific. This message popup indicates that an error probably occurred in the installation of the CEC/IMC Manager program.

One or more required files could not be located when attempting to execute the client program. A message listing the "missing" files will appear before this message (see preceding message popup). These files must be available before the client program can be successfully executed.

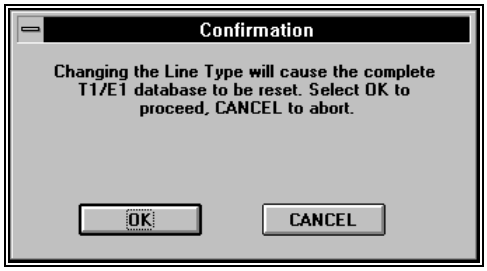
The ID (LID) entered in the Console configuration dialog box does not fall within the accepted range. This will usually occur with a previously unconfigured entity where the ID defaults to 16383. Also see the following message popup box, which is very similar.

In systems with a System Manager running V5.0 software, the Unit ID (LID) and Console Alias fields may be edited. The Unit ID values entered in these fields must be valid LIDs (existing at the System Manager), identified as consoles at the System Manager, and be downloaded to the CEC/IMC Manager. The user is not prevented from using the entered ID.



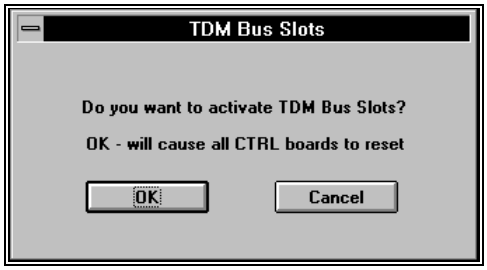
If the console selected does not exist in the CEC/IMC (in this example Console 7) this message will be displayed when a Send of Console User Profile or C3 Maestro Hardware configuration data is attempted. When the Send is attempted a "Save to Disk Successful" message will be received before this message. The Node ID displayed is the CEC/IMC "switch assignment number" corresponding to the local CEC/IMC, the Console number displayed will be the corresponding "console assignment number" of the console selected.

The Delete button has been chosen in one of the Console Configuration dialog boxes, this pop-up box is prompting confirmation of the decision to delete the currently selected Console configuration database.

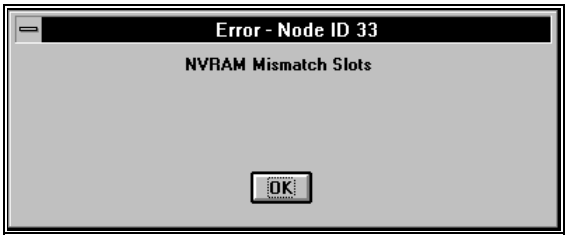


T1/E1 selection is performed at the CEC/IMC Manager on a CEC/IMC wide basis. Changing the line type will cause the entire T1/E1 database to be reset (lost) for all T1/E1 interface modules. T1 or E1 selection is dependent upon the line service coming into the CEC/IMC (T1 and E1 lines are physically different). Selecting T1 or E1 should only be required when the system is first configured, after that the current system configuration will be indicated when the Audio Interface Type dialog box appears on screen and **changing line type is not necessary or desired**. Choose the Cancel button to return to the Audio Interface Type dialog box. **Choosing OK will cause the entire T1/E1 database to be lost for all T1/E1 interface modules in the CEC/IMC**.

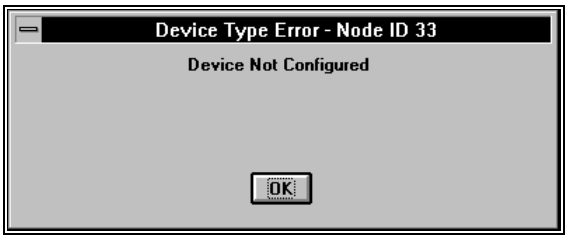
A Send of an unconfigured and inactive (** prefix) interface module was attempted from the Site Channel Configuration List dialog box. Site "4" is a "filler" site number, the actual site number displayed will be the corresponding "site assignment number" of the interface module selected in the "Active/Configured Sites:" list when the Send was attempted.



When Bus/Slot configuration data is "sent" from the CEC/IMC Manager to the CEC/IMC, the Bus/Slot data is first compared to the current configuration at the CEC/IMC Manager; if different, this data is sent to the MOM Controller Board. When the MOM Controller Board receives the new data this acknowledgment message is sent to the CEC/IMC Manager. The new Bus/Slot configuration will not go into effect unless all CEC/IMC Controller Boards are reset (Choosing OK). Choose Cancel to exit this popup box without causing any action by the CEC/IMC.



When the CEC/IMC MOM Controller Board ⇔ CEC/IMC Manager communication link is established, the CEC/IMC Manager compares the disk stored Slot assignments with the MOM Controller Board NOVRAM Slot assignments. If that comparison fails, this error will be displayed. The Node ID (if displayed) refers to the CEC/IMC "switch assignment number."

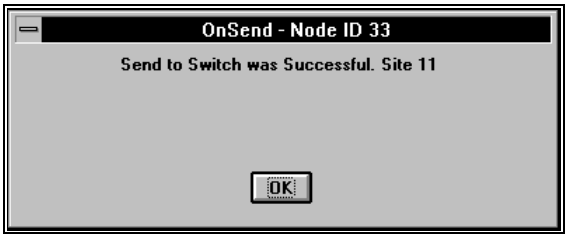


If any active devices haven't been configured for audio when the CEC/IMC MOM Controller Board ⇔ CEC/IMC Manager communication link is established, this error will be displayed. Verify active devices are configured to clear this error.

This pop-up box will appear if you attempt to exit a dialog box without first saving changes. Choose Yes to save the changes and exit, No to exit without saving the changes, and Cancel to return to the dialog box.

The information saved was successfully saved to the CEC/IMC Manager hard disk.

The T1/E1 database was successfully downloaded (sent) from the CEC/IMC Manager to the CEC/IMC MOM Controller Board.



Configuration data was successfully sent from the CEC/IMC Manager and to the CEC/IMC MOM Controller Board. Any audio configuration changes will be sent to the appropriate interface module Controller Board. Any Bus/Slot configuration data will be compared to the current configuration at the CEC/IMC Manager; if different, this data is sent to the MOM Controller Board and when the MOM Controller Board receives this new data an additional, different acknowledgment message will be sent to the CEC/IMC Manager. The Node ID displayed is the CEC/IMC "switch assignment number" corresponding to the local CEC/IMC, the Site number displayed will be the corresponding "site assignment number" of the interface module.

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Glossary of Terms

Aegis

Aegis is Ericsson's digital voice audio system that employs advanced Digital Signal Processing (DSP) circuitry. Aegis has two primary modes – "Aegis digital" and "Aegis private." Aegis digital mode offers improved weak signal performance and impedance to unauthorized monitoring when compared to standard analog (clear) voice transmissions. Aegis digital transmissions are not encrypted. Aegis private mode also offers improved weak signal performance. In addition, since Aegis private transmissions are encrypted, Aegis private mode provides very secure communications against unauthorized monitoring.

Audio Board

The **Audio Board** routes audio, mobile data, and Aegis data between EDACS radio systems, dispatch consoles, logging recorders, etc. The board digitizes analog signals applied to its audio inputs and applies the digitized signals to the TDM bus. It performs the reverse process for its audio outputs.

bit error rate

The average rate of errors on a radio channel, usually expressed as a percent (e.g., a 5% error rate indicates an average of 1 error in every 20 bits transmitted).

C3 Maestro

The **C3 Maestro** is the CRT-type console that is designed to take advantage of the advanced features of EDACS. It consists of a specialized audio unit and an IBM PC compatible computer running custom software developed by Ericsson.

Call Director

A **Call Director** (CD) is optional hardware equipment interconnected to a dispatch console such as the C3 Maestro. It interfaces a console to a telephone network.

Call Director patch

The **Call Director patch** feature allows the dispatcher at a console to "patch" a telephone line to a specific unit, talk group, conventional channel, or radio patch in the CEC/IMC network. The term *patch* or *patched*, derived from *phone patch*, is used to signify the CD is connected to the CEC/IMC. A Call Director patch should not be confused with a radio-type patch in which a collection of radio talk groups are interconnected for common communications as one group. (See **patch ("soft"/console)**.) The console uses a secondary LID (Logical ID) for the patch channel requests, thus allowing CD patch operation to work separately from, and concurrently with, the normal console-to-radio dispatch communications.

CAM

Centralized **A**ctivity **M**odule – The CAM is a CEC/IMC interface module that provides call activity information to the **C**entralized **A**ctivity **L**ogger (**CAL**) computer. Usage and billing information can be generated with the CAL through the CAM link.

Causeway patch

The **Causeway patch** feature allows a conventional channel to be patched directly to a trunked talk group via the trunked group's Group ID (GID) number. All conventional channels in a CEC/IMC can be Causeway patched. Causeway patches are setup and deactivated at the CEC/IMC Manager, not consoles. Consoles and trunked sites in the CEC/IMC network know nothing about Causeway patches, except the respective GID number. This feature was previously referred to as "hard patch." (Also see **patch ("soft"/console)**.)

Causeway simulselect

The **Causeway simulselect** feature allows a conventional channel to be simulselected to a trunked talk group via the trunked talk group's Group ID (GID) number. All conventional channels in a CEC/IMC can be Causeway simulselected. Causeway simulselects are setup and deactivated at the CEC/IMC Manager, not consoles. Consoles and trunked sites in the CEC/IMC network know nothing about Causeway simulselects, except the respective GID number. This feature was previously referred to as "hard simulselect." (Also see **simulselect ("soft"/console)**.)

CCI Board

Conventional **C**ontrol **I**nterface **Board** - This is a CEC/IMC Controller Board configured for use in the CIA rack. It provides master CI Board control. The control data port that connects the CIA rack to the VMIM is also located on the CCI Board. (Also see **CI Board**.)

CEC

Console **E**lectronics **C**ontroller – The CEC is an advanced radio communications controller incorporating time division multiplex digital audio switching technology. The CEC connects dispatch consoles to EDACS and CNI systems.

CEC/IMC Manager

The **CEC/IMC Manager** (formerly referred to as the "MOM PC") provides CEC/IMC monitoring and configuration functions. This IBM PC compatible computer running custom software developed by Ericsson is the window into the CEC/IMC for the system administrator and service technicians.

CI Board

Conventional **I**nterface **Board** – This board is located in the CIA secondary interface rack. It contains circuitry used to connect conventional tone and DC controlled base stations and voting systems to the CEC/IMC switch.

CIA rack

Conventional **I**nterface **A**dapter **rack** – The CIA rack allows conventional tone and DC controlled base stations and voting systems to be connected to the CEC/IMC. It is considered a "secondary interface" since it does not have direct TDM and GSC bus connections to the primary CEC/IMC interface modules.

CIM

Console **I**nterface **M**odule – The CIM is a CEC/IMC interface module used to connect C3 Maestro (CRT-type) and C3 Modular/Desktop consoles to the CEC/IMC. A CIM consists of a Controller Board and an Audio Board. A C3 Modular/Desktop console also requires a C3 Console Translator interface module. (See **XLTR**.)

CNI

Conventional **N**etwork **I**nterface – A conventional base station can be connected to the CEC/IMC by a CNI. The CNI is formed by a GETC shelf located at the conventional station that makes the conventional station appear to a MIM as an EDACS trunked site. In the CNI system, different Channel Guard tones are assigned to different talk groups.

confirmed call

The **confirmed call** function ensures all EDACS radio systems being called have working channels available before the caller is given a channel access (talk permit) tone. This function can be disabled on a per system/group basis.

control data

Control data includes any data used for system control.

Controller Board

The **Controller Board** processes control data, holds databases, and controls the Audio Boards within its respective interface module.

CTIM

Centralized **T**elephone **I**nterconnect **M**odule – The CTIM is a CEC/IMC interface module used to connect Centralized Telephone Interconnect System (CTIS) equipment to the CEC/IMC so radio users and dispatchers can access land-line telephone systems.

DC control

Remote control of a base station over metallic lines by applying different DC voltages and polarities to select different functions.

default value

The software provides predetermined or **default values** in a majority of the data entry fields within the program. The default values assume that the program will be used without optional features. Before changing default values, the operational implications should be understood.

distributed multisite

Two or more IMC networks can be linked together for **distributed multisite** communication. Audio and control data is transferred between the different IMC networks via a NIM at each IMC. (Also see **StarGate Controller**.)

DPRAM

Dual **P**ort **R**andom **A**ccess **M**emory – These specialized memory chips have two separate data buses that allow two microprocessor chips to quickly and efficiently transfer data between each other.

DVIM

Digital **V**oice **I**nterface **M**odule – The DVIM is a CEC/IMC interface module that connects **D**igital **V**oice **I**nterface **U**nits (**DVIU**) to the CEC/IMC to provide Aegis digital and Aegis private voice operation for dispatch consoles, Jessica PBX, and CTIS equipment. (Also see **Aegis**, **Jessica PBX Gateway**, and **CTIM**.)

EDACS

Enhanced **D**igital **A**ccess **C**ommunication **S**ystem – The term "EDACS radio system" refers to RF equipment that may be interfaced to the EDACS CEC/IMC Digital Audio Switch. The RF equipment may be located at a single location, such as an EDACS trunked site or it may be located at several locations, such as in a voting system. Other examples of EDACS radio systems include simulcast, CNI, and SCAT systems.

EDG interface module

EDACS **D**ata **G**ateway **interface module** – Mobile data is forwarded to the CEC/IMC Digital Audio Switch from the EDG computer equipment via the **EDG interface module**. This interface module's Controller Board is typically labeled "**DATA**."

extended network

Extended network is a System Manager term which refers to distributed multisite communication. Users must be "extended network enabled" before distributed multisite communication can occur.

Failsoft

Failsoft refers to an EDACS trunked site's mode of operation when the site's Site Controller is not operational. The site's control channel GETC has primary control of basic trunking features.

Failsoft 2

Failsoft 2 refers to a site's mode of operation when its control data link is not operational. This could occur, for example, if the phone lines between the uplink and downlink GETCs are defective. During the Failsoft 2 mode, multisite communication with units logged onto the failed site is not possible.

field

Field refers to the area of the dialog box which allows data entry for a particular parameter or displays information concerning operation of the CEC/IMC relevant to that particular dialog box.

FIFO

First **I**n **F**irst **O**ut – FIFO integrated circuits provide the interface between digital information paths of widely varying speeds. This allows the information source to operate at its own intrinsic speed, while the results may be processed or distributed at a speed commensurate with need.

GETC

Ericsson **G**eneral **E**lectric **T**runking **C**ard – The **GETC** is a microprocessor-controlled shelf that can be configured to perform many different signal processing tasks for EDACS radio communications equipment. In CEC/IMC applications, each GETC is equipped with a 9600 baud modem that provides serial control data communications between different radio systems.

GSC bus

Global **S**erial **C**hannel **bus** – The **GSC bus** is a high-speed serial bus which provides packetized control data transfers between Controller Boards in the CEC/IMC Digital Audio Switch.

hard patch

See **Causeway patch**.

hard simulselect

See **Causeway simulselect**.

HDLC

Highlevel **D**ata **L**ink **C**ontrol – A standard bit-oriented protocol developed by the International Standards Organization (ISO). With HDLC, errors are less likely to occur because control information is always placed in the same position and specific bit patterns used for control are much different from those used in representing data.

HSCX

Highlevel **S**erial **C**ommunications **C**ontroller e**X**tended – The HSCX is an integrated circuit (IC) designed to implement high-speed communications links using HDLC protocols and to reduce the hardware and software overhead needed for serial synchronous communications.

IMC

Integrated **M**ultisite and **C**onsole **C**ontroller – The IMC is Ericsson's EDACS Digital Audio Switch that routes audio, mobile data, and Aegis data between EDACS radio systems and dispatch consoles. It is a second generation multisite controller plus a console controller for the C3 series consoles.

interface module

The term "CEC/IMC **interface module**" is used to refer to a subset of hardware components within the CEC/IMC that permits it to be connected or linked to an external device such as a dispatch console or an EDACS radio system. Each interface module is formed by a Controller Board and usually one or more Audio Boards. This term replaces the term "subsystem" and it may sometimes be referred to as a "node." Examples of CEC/IMC interface modules include: MIM, CIM, LRIM, VMIM, and RIM.

Jessica PBX Gateway

Jessica Private **B**ranch e**X**change **Gateway** – This advanced telephone interconnect system is used with CEC/IMC equipment to provide EDACS radio system users access to local public switched telephone networks (PSTN). Jessica incorporates the Ericsson MD110 PBX. It is interfaced to the CEC/IMC via a PIM. (Also see **PIM**.)

LRIM

Logging **R**ecorder **I**nterface **M**odule – This CEC/IMC interface module provides audio outputs for logging recorders. Each output channel can be programmed to supply audio based on groups or individual units within the CEC/IMC network.

message trunked call

A **message trunked call** is a call which is assigned a working channel for the duration of the entire communication process, not just a single PTT sequence. This accomplished by adding hang-time after each PTT. Emergency and telephone interconnect calls operate in a message trunked mode. (Also see **transmission trunked call**.)

MIM

MASTR II/III **I**nterface **M**odule – The MIM connects an EDACS radio system to the CEC/IMC switch. EDACS radio systems include EDACS sites, simulcast systems, CNI systems, and SCAT systems.

modem data

Modem data includes any system control, digital voice, or user data transferred via modem equipment using modulated/demodulated signals. For example, the uplink/downlink control data transferred between the CEC/IMC location and an EDACS trunked site is modem (control) data.

MOM

MOnitor **M**odule – The MOM is a CEC/IMC interface module that provides serial data connections for the CEC/IMC Manager (MOM PC) and the System Manager computers. It also provides many important functions for the CEC/IMC and it stores certain databases for the CEC/IMC such as the current ("soft" or console) patch/simulselect settings made from consoles.

MOM PC

See **CEC/IMC Manager**.

multisite

A **multisite** is a network of multiple EDACS radio systems and possibly conventional radio systems all linked together for wide-area communication. In a multisite network adjacent systems do not use the same radio frequencies.

NIM

Network **I**nterface **M**odule – Two or more IMC networks can be linked together for distributed multisite communications using a NIM at each IMC Digital Audio Switch. NIMs can also link a remote CEC to an IMC for remote console applications.

NOVRAM

NOn**V**olatile **R**andom **A**ccess **M**emory – NOVRAM is specialized RAM used on the certain CEC/IMC boards/cards for storage of data which must be maintained through a power on-off-on cycle such as LID and GID databases, and configurations specific to the particular CEC/IMC interface module.

NOVRAM clear

A **NOVRAM clear** occurs when interface module specific data within a Controller Board's NOVRAM is deleted. NOVRAM must be cleared prior to certain configuration and diagnostic procedures.

NOVRAM reset

(See **NOVRAM clear**.)

patch

The term "**patch**" refers to the operation performed when two or more entities are connected together for common communication as one entity.

patch ("soft"/console)

A **patch** ("soft" or console) is when two or more talk groups are connected together by a dispatcher at a console, this allows the patched groups to communicate as a single group. "Soft" or console patches utilize a special group ID number referred to as a SAID. (Also see **Causeway patch** and **Call Director patch**.)

PCM

Pulse **C**ode **M**odulation – An audio processing technique used to encode and decode analog signals so they can be transferred digitally.

PIM

Private Branch eXchange (PBX) **I**nterface **M**odule – This CEC/IMC interface module supports Jessica PBX Gateway equipment. It provides the audio and control data links into and out of the CEC/IMC to and from Jessica. (Also see **Jessica PBX Gateway**.)

ProSound

When roaming on a wide area (multisite) network, **ProSound** enables a radio to select a new site based upon the bit-error-rate of the "adjacent" sites' control channels. The roaming operation is referred to as "wide area scan" or "wide area system scan." ProSound ensures the newly selected site's working channel(s) will be sufficient to provide quality audio. During wide area scan operations, EDACS allows up to six (6) adjacent sites to be scanned.

radio system

See **EDACS radio system**.

RIM

Request Status Monitor **I**nterface **M**odule – The RIM interface module enables the RSM computer to request information from radios within the network.

RSM

Request **S**tatus **M**onitor – The **RSM** is an IBM PC compatible computer running custom software developed by Ericsson. It allows the system administrator and/or the dispatchers to view status of EDACS units within the CEC/IMC network. Status information is typically initiated (transmitted) by the radio operator to identify the current condition (in route, at scene, etc.) of the unit.

secondary interface

The term "**secondary interface**" refers to the CIA rack. This rack is considered to be secondary because it is not connected to the primary TDM and GSC buses within the CEC/IMC.

Secur-It™

The Secur-It / function / hold tones are used for conventional base station remote control. This tone control sequence is generated by the CI Boards installed in the CIA rack(s). The tone sequence consists of two or three parts, the first part is the Secur-It tone, followed by the function tone, followed by (for transmit functions) the hold tone. The Secur-It tone level is always +30 dB above the hold tone and the function tone is always +20 dB above the hold tone.

simulselect ("soft"/console)

A console operator can simultaneously communicate with two or more talk groups by selecting the groups for "**simulselect**" communication. Simulselect communication uses only a single radio channel at each active radio system. These "soft" or console simulselects utilize a special group ID number referred to as a SAID. (Also see **Causeway simulselect**.)

site

This term normally refers to radio equipment at a single specific location. (Also see **site assignment number**.)

site assignment number

In most cases, the term "site" in this program does not refer to an EDACS trunked site or any other type of radio system. It refers to a site-type interface module within the CEC/IMC/StarGate Controller/etc. Digital Audio Switch. The number that follows is the interface module's site assignment number. This number corresponds to and matches the site assignment number set by the 5-bit DIP switch setting on the interface module's Controller Board.

StarGate Controller

A **StarGate Controller** is an IMC switch specifically configured for distributed multisite operation. It is the central point or "hub" for all distributed multisite communications. A StarGate Controller is formed by NIM interface modules and a MOM interface module.

StarGate Manager

When connected to a StarGate Controller, the CEC/IMC Manager may be referred to as a "**StarGate Manager**." (Also see **CEC/IMC Manager** and **StarGate Controller**.)

TDM bus

Time **D**ivision **M**ultiplexed **bus** – The TDM bus in the CEC/IMC Digital Audio Switch is a digitally multiplexed bus system used to transfer audio, mobile data, and Aegis data throughout the CEC/IMC. Each signal coming into the CEC/IMC is assigned a TDM time slot and receiving devices extract the digitized signals from the appropriate time slot.

tone control

The use of audio tones for remotely controlling a base station over a communication path, eliminating the need for a metallic circuit.

tracking

In a multisite network all active radios log into their particular system. This login information is databased to allow the CEC/IMC to track individual radio units as they move from system to system. The CEC/IMC can then route wide area calls based on this database.

transmission trunked call

A **transmission trunked call** is a call which is assigned a working channel only for the duration of the caller's PTT sequence (the call operates with zero hang-time). Individual and group calls are transmission trunked calls. Because EDACS has fast channel access and drop times, transmission trunking is significantly more efficient than message trunking. (Also see **message trunked call**.)

VMIM

Con**V**entional **M**ASTR II/III **I**nterface **M**odule – The VMIM couples the CIA secondary interface rack to the primary CEC/IMC interface modules. The VMIM - CIA set allows conventional base stations and conventional satellite receiver voting systems to be connected to the CEC/IMC.

XLTR

C3 Modular/Desktop Console **Translator** – Using data protocol conversion techniques, this interface module allows the CEC/IMC to communicate with a C3 Modular/Desktop console. The XLTR is placed in the control data path between the C3 console and its respective CIM. It is a Controller Board with unique firmware and DIP switch settings.

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Ericsson Inc.
Private Radio Systems
Mountain View Road
Lynchburg, Virginia 24502

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